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ON THE DEMODEX FOLLICULORUM AS THE PARASITE CAUSING THE MANGE OF DOGS AND ITS TRANSFER UPON MAN.

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A COMMON skin disease of the human race, called itch, is caused by an eight-legged animal of the spider tribe, called the itch-mite. Many animals are subject to similar diseases, caused by parasites belonging to the same arachnoid tribe, but constituting separate species. It looks almost as if each separate species of animal was inflicted with a peculiar species of itch, or mange-mite, just as it is afflicted with a specific louse or bug. The itch peculiar to animals is generally termed "mange," and from the rough and dishevelled appearance which it gives to animals which are covered with hair, is called "Räude" in the German language. Most domestic animals are liable to become affected with mange, in the almost direct ratio in which by their mode of life they become exposed to infection. The horse is less frequently victimised, but it is liable to become the host of two different species of mite, one spreading on the skin, the other being confined to the soft part of the hollows above the hoofs, where it causes deep ulcerations (*Sarcoptes hippopodus*).* The ox tribe, particularly young individuals, heifers and calves, are subject to a quickly spreading mange, caused by a mite, very much like, but not identical with, the species living on the foot of the horse. The sheep-mite is a most grotesque animal, with

* In this, as in some points, the author is incorrect. Had he referred to Neumann's "Parasites and Parasitic Diseases of the Domestic Animals," English edition, he would have obtained information on this subject which would have prevented such mistakes.—Ed., *V. J.*

long hairs inserted in the ends of its four hind feet, taking the place of claws. Dogs are known to be mangy sometimes, but the mites which cause this disease have, with the exception of the cases of Gruby and Topping, to be related below, never been described with sufficient accuracy. Cats also are subject to a kind of mange, caused by a true itch-mite, *sarcoptes catorum*, which is said to be transferable to dogs, hyænas, bears, sheep, apes, and guinea-pigs, and is of about half the size of the human itch-mite.

Amongst these mites there are certain varieties which are occasionally or accidentally transferred from the animals which are their usual abode, to man. It is true that they do not prosper and propagate on the human skin as well as they do on their appropriate host, but they cause notable diseases.

They excavate passages and produce itch-like eruptions of considerable variety. In general, however, according to Küchenmeister, these eruptions only last as long as the individual life of the mites transferred. Some observers allow that the irritation may last from two to three weeks, others to six weeks and more. It does not appear possible for most of these animals to pass through their entire cycle of development upon the human subject, and from this inability only those seem excepted which resemble the true human itch-mite in structure, and only differ from it in size. In the consideration of cases of infection of human beings by transfer we must take care not to overlook the possibility of frequent, perhaps daily, infection taking place during the long intercourse of animals in a state of incipient or actually expressed mange, and we must take care not to assume such cases to be the lasting consequence of a single primary infection.

Now the true sarcoptes of the cats, which, as we have seen, may be transferred to dogs, hyænas, bears, sheep, apes, and guinea-pigs, can also be transferred to men. The mite of the mangy lion can also be transferred to man ; it is said to be larger than the cat-mite, and exactly like that of the human subject.

The mange of the dog has also been known to be transferred to man, and such, *scabies canina*, in the human subject is mentioned by Sauvages (" Nosologia," Amstelod., 1763, II., 464) and Viborg. Hertwig saw two boys who had become infected by a mangy dog. The mite causing this mange was similar to the horse-mite, and therefore very unlike the animal which we shall have presently to describe.

The transfer of the horse-mite to man has been proved by a number of observers, amongst them E. Viborg, Lick, Sydow, Osiander, Greve, Grognier, and especially by Hertwig, under whose inspection Schade made the experiment of transferring horse-mites to his own skin. They caused a rash, but died after twelve days, while in Greve's observation the local disease caused by accidental infection lasted from two to eight weeks.

The transfer of the mange-mite of the heifer on to man I was the first to observe upon a peasant and his child, who had rubbed the mangy heifer with an embrocation, and touched his face while doing so. The hair follicles of the beard were mostly ulcerated, and out of these ulcers I removed several living specimens of a mite which had not been described before, and to which I gave the name of *sarcoptes setosus*, because it was covered with many bristles.

Some years after this I received some mites from the Churchwardens of St. Peter's, Colchester; they were samples of millions of mites which had invaded the church from the crypts below, and driven out the congregation. Several persons had become affected with them. They were identical with the mites found by me upon the peasant's face, transferred from the heifer, and had been sent to me because of their resemblance to the sarcoptes described by me, which had been recognised by a local medical man, Dr. Becker. Church and crypts were purified by chemical means.

Whether the mite of the sheep mange can be transferred to man or not is not quite certain.

When one and the same species of mite is found to live upon man on the one, and upon a species of animal on the other hand, it is natural, if not necessary, that we should assume that it is transferable from one to the other and the reverse. This assumption seems to me reasonable in the case of the mite now to be described, which has long been known to live without causing much disease in the larger follicles of the skin of the face, nose, and ears of man, has been successfully transferred upon the dog and produced the mange, or a kind of mange, has been extracted from the pustules of a mangy dog, and is now fully proved to be the cause of one of the most terrible kinds of mange that can befall any animal.

In the autumn of 1888, I received a three-quarter grown deerhound puppy, as a present from a Scotch laird; the animal had been reared at the gamekeeper's lodge, and was in very good condition, with the exception of his neck and

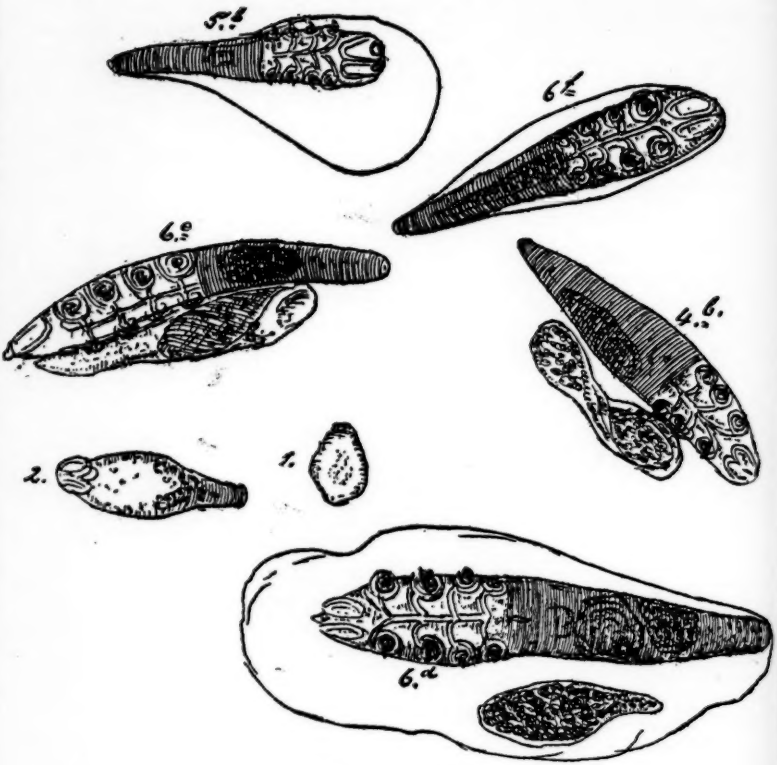
jaws, which were scurfy and red. Notwithstanding great care and cleanliness, this scurf spread irregularly over his body; suddenly pustules arrived, which quickly filled with blood, and crusted the skin and matted the hair. Hundreds of such pustules now formed all over the backside of the animal; twelve were counted in a single square inch; they absolutely pierced the skin and laid bare the cellular tissue, which now oozed blood and serum. I cut the hair from all affected parts, removed all crusts, emptied all pustules by pressure, dusted the sore places with zinc oxide, and anointed the dog with sulphur ointment. The dreadful state in which the animal was can hardly be described. He was laid upon a table for each dressing, on two cushions covered with several folds of paper and a double sheet over these. At the termination of the dressing these coverings were mostly soaked with blood and serum. He was wrapped in flannel, which had to be changed every twenty-four hours, or as often as it was soaked with blood and serum. The dressing of the dog sometimes occupied two men during from three to five hours, and without such care the animal could not have survived. His lips were fissured, his nose crusted, and the parts under the tail were in a state of rawness down to the tarsal joints. He was fed upon milk, beef steak, and boiled bacon. When the pustules were well pressed out and dressed with zinc they healed quickly. But the disease wandered about in a marvellous manner. It first ascended the hind-legs up to the back; then extended over the shoulders and sides; it then laid hold of the neck and ears, which were swelled like tripe, hot and painful; it then invaded the flanks; the tail had shown a few spots, but became suddenly at the later stage of the disease riddled with pustules, and was very much swelled and painful. The dog lost nearly all his hair, not only in places where there had been pustules, but also, though later, over all other parts, where there had been no visible corrosion of the surface, or even scurf formed. The feet became affected, sore between the toes, and into the socket of the claws, and were swelled, and evidently affected in the hair-follicles. He consequently limped for many weeks, the affection changing from foot to foot.

On placing some of the matter squeezed out of a pustule under the microscope I saw at once numbers of animals closely resembling the well-known inhabitant of the black pointed follicles of the nose and other parts of the skin of man, the *Demodex folliculorum*. Even the smallest amount ofmatter contained many specimens, one microscopic slide

showing upwards of sixty. By close scrutiny I convinced myself that this animal from the dog was *identical* with the human parasite, as will be seen by the following illustrations, which are accurate representations of the microscopic appearance, and their comparison with the figures recorded in literature. I have not been able to discover a single point of essential difference between the human and canine Demodex.

Definition.

The parasites in question belong to the division *Articulata;* Class I, *Arachnida;* Order I, *Acarina*, Mites. The *first family* is composed of the *Linguatulidæ*, of which the most remarkable species is the *Pentastomum taenioides, denticulatum*, and other names. This lives in its early stages in the liver of



EXPLANATION OF FIGURES.

FIG. 1.—Short oval body, probably ovum.

FIG. 2.—Embryo with head and masticating apparatus, but without legs, and without separation of cephalothorax from abdomen.

FIG. 3.—Embryo with six legs, thin and slender abdomen.

FIG. 4*a*.—Head and cephalothorax and abdomen fully developed, except as to legs, of which only three pairs are as yet present.

FIG. 4*b*.—Same as 4*a*, a distinct organ in abdomen, underneath a cast skin.

FIG. 5*a*.—Fully developed eight-legged demodex; contents of abdomen not yet differentiated.

FIG. 5*b*.—Same as 5*a*, but embedded in a defined mass of fibrin.

FIG. 6*a*.—Most developed demodex seen from side; what is apparently intestine is seen filled with granular matter.

FIG. 6*b*.—Group of nearly fully developed mites, showing the manner in which they were packed in the pustules, sometimes by hundreds.

FIG. 6*c*.—Single active demodex, opening and closing palpæ.

FIG. 6*d*.—Large demodex with differentiated abdominal contents; underneath it a cast skin of a larva; both embedded in lump of fibrin.

FIG. 6*e*.—Living demodex lying on dead one.

FIG. 6*f*.—Demodex with defined intestinal contents, surrounded with fibrin.

man, and some domestic animals, notably the rabbit, and in its developed condition in the nasal and frontal cavities of the dog. The *second family* was called *Simonida*, after G. Simon, the discoverer of the first species, by Vogt. He gave the following zoonom cal definition :—"Corpus vermiculare, ætate proficiscente diminutum; cephalothorace latiore et molli; pedes breves truncique, mediano aculeo majore armati, in statu immaturiore pedibus 6, in maturiore 8, organa manducatoria restellum parvum medianum, duabus laminis gladiformibus acutis armatum, palpisque 2 brevibus, duos articulos exhibentibus conicisque instructum præbentia."

Von Siebold insisted that the name of Acarus should be retained for the pimple-mite, as there were other long-tailed *Acari*, including that discovered by Dugès in small pouch-like galls of the leaves of the lime-tree.

In Küchenmeister's "Animal Parasites," (Sydenh. Soc. Edit. 1857, p. 15) we find the following definition of the Acarus folliculorum :—"Signa generis. Longit., $\frac{1}{10}'''$ Organis generationis omnino ignotis; evolutione imperfectissime cognita. Species vivipara (Wedl)? Habitat: in capillorum folliculis glandulisque sebaceis humanis et sanis et ægre intumidis, inprimis in tota pilis majoribus carente facie, præterea etiam in reliquis corporis regionibus, ex. c., in pectore dorso, etc."

Description of the Mites from the Deerhound.

The mites vary from 0·085″′ to 0·125‴ in length, and 0·020″′ in breadth. The head looks at first sight like a horseshoe. This appearance is produced by two lateral two-jointed palpi, a tubular proboscis, and a triangular biting organ composed of two fine saw-like bristles, all being at rest; during the action of biting the two palpi elongate forwardly and separate, and are then seen to be sickle-shaped and to be drawn against each other by a lever action of their bodyward ends.

The head and thorax are not separated, but combined so as to constitute a cephalothorax.

The feet are short, conical, with three joints, each joint starting from its basal one with a considerable contraction. In the median line of the ventral side of the cephalothorax runs a longitudinal ridge, marked by two parallel lines, from which ten or eight parallel double lines run towards the eight or six feet, and surround them at their base in the shape of rings. The spaces enclosed by these lines look like and are probably chitinous scales, on which the feet are implanted, and the

narrow intervals between the lines appear to be thinner membranes of chitin to admit of flexion, expansion, and contraction.

Simon believed that these lateral double lines ran round the dorsal side of the mite as well, but Küchenmeister could never observe this. The arrangement of the lines, however, gives to the cephalothorax the precise appearance of segmentation, and seeing that the vermicular abdomen or tail is also finely segmented, the view of Simon is in so far probable that the segments are marked on the dorsal aspect, but much less than on the ventral side. The terminal joint of the anterior feet has, according to Miescher, four, that of the hinder feet five processes. Simon, however, describes the terminal joints as bearing three claws, each at their extremity, a long one and two shorter ones. To me, also, this appeared to be the real state of things, when I viewed an animal which was so far active as to vigorously move its masticatory apparatus and feebly its feet. Wedl was unable to quite define the parts or the extremities. Küchenmeister believed that he saw only a single hooked claw, of a very delicate kind, projecting from the centre of the foot. On the anterior free margin of each foot he saw a pair of straight sharp processes, the nature of which he could not make out completely, but the whole description coincides with that of Simon.

Küchenmeister described three forms of the dermodex, as follows :—

First Form.—The abdomen is about three times as long as the anterior part of the body ; the tail is notched like a file. The contents are finely granular, brown or blackish by transmitted light ; there are also visible transparent, irregular, round, or oval spots. Some observers believe to have distinguished an æsophagus, intestine, and liver. This form was supposed to be one approaching to maturity. It has four pairs of feet.

Second Form.—The abdomen is considerably shortened, and sometimes scarcely longer than the cephalothorax, forming a conical body, pointed towards the caudal extremity ; it is always finely segmented. The cephalothorax always bears eight legs. This form is supposed to be nearest to maturity. Some suppose that the abdominal appendage disappears altogether as the animal reaches its complete development. Küchenmeister, however, thinks this improbable. In one case he found this form with the short abdomen particularly plentiful, whilst Simon found the first form to be the most abundant.

This short abdomen form was only rarely met with on the dog here described.

Third Form.—It has only three pairs of feet; is narrower than the other forms; the transverse rings in the abdomen are said by some to be wanting; I have, however, always found them to be present. The contents of the abdomen are paler and less in quantity; in other respects it resembles the first form. This younger grade is supposed by Küchenmeister to be converted into a higher form, which slips the larval skin.

With these forms there also occurs in the follicles of the skin of man a body which Simon regards as an empty egg-shell, and Wedl as a very young animal. The latter supposes that this very young animal occurs already in the anterior part of the abdomen of the mother, and that he was able to observe the development of the six-legged form from this structure, its middle and hinder part diminishing in breadth, and becoming elongated, when oral organs (of mastication) and pad-like elevations, the bases of feet, grew forth.

The forms extracted from the pustules on the skin of the deerhound were the following (see the Figures and their explanation):—

1*st Form.*—Short, oval, or corn-shaped bodies, possibly ova (Fig. 1).

2*nd Form.*—Longer, urn-shaped embryos, with a distinct head and masticating apparatus, but no legs and no separation of cephalothorax from abdomen. The tail end segmented, but the body only feebly so. Small amount of granular contents, but no groups of matter resembling organs in the interior (Fig. 2).

3*rd Form.*—Animals of the same size as the 2nd form, but with the characteristic double lines, and three pairs of legs on cephalothorax. Abdomen short, thin, slender, without differentiated contents (Fig. 3).

4*th Form.*—Head and cephalothorax with three pairs of legs fully developed, but abdomen of equal length with cephalothorax, or one and a-half times as long (Fig. 4*a* and 4*b*.)

5*th Form.*—Animals of the same size as 4th form, but with four pairs of legs. Contents of abdomen still undifferentiated (Fig. 5*a* and 5*b*).

6*th Form.*—Large plump animals, with progressive development of abdominal contents resembling distinct organs. But the relative nature of these organ-like agglomerates could not be diagnosed (Fig. 6*a*, 6*b*, 6*c*, 6*d*, 6*e*, 6*f*.)

Besides the complete animals of the six forms, there were numerous more or less distinctly shaped lifeless bags, being either dead animals in a state of decay, or probably more frequently cast skins of several larval stages.

As acari, though atracheate to sight, they are possibly air breathers, and as larvæ may respire through a porus at the tail-end; possibly, like maggots, they rise up to the surface to respire, and then dive down again into the pustule, or follicle, to feed. When the pustule gets crusted over, or flooded with blood, or both, most acari seem to die. At least I have found it exceedingly difficult to obtain some which were undoubtedly alive and moving, out of such blood-filled pustules.

Transfer of the Demodex from Man to the Dog.—Gruby transferred the acarus from man to a dog. In the course of two years these mites had increased so enormously that they occupied every cutaneous follicle, and the dog lost all its hair and became quite nude. Simon and Wedl doubted this statement, and Küchenmeister approved of this doubt. My observation shows that these doubts are of no value whatever, and I believe that Gruby's experiment was conclusive and true.

Küchenmeister says that Oschatz found a similar acarus in the glands of the eyelids of a sheep. It was, however, broader generally, and especially at the cephalothorax. No literary reference to this observation of Oschatz is given.

Symptoms produced in the Human Subject by the Demodex.—The animal may live in the follicles of the nose, chin, forehead, ears, and back without producing any other symptom except that of seborrhœa, in consequence of which the contents of the follicle increase and collect; the contents may be squeezed out, and the follicles may collapse. This absence of inflammatory irritation is the most common case in man.

But in a number of cases the follicles become inflamed, and the sebum is surrounded with pus. In that case there may be discharged, on pressure, the plug of sebum, the surrounding pus, the acarus, or acari, some blood, and some serum. The collection of pus may repeat, particularly on a subject which is affected with a constitutional dyscrasia. Thus Remak has recorded the case of a man, a commercial traveller, who had suffered for three years from disfiguring acne of the chin, nose, forehead, and back. He had been vainly treated for supposed enthetic disease, until Remak, after long seeking, found the mite by entirely removing some of the pustules and dragging the mites from their bottom, sometimes from a

depth of nearly a line. It is, therefore, certain that in erethic individuals the acari may become the cause of inflammatory and severely annoying acne.

Diagnosis.—In many persons the pointed contents of the follicles, or of inflamed and purulent pustules, may be evacuated by pressure with two fingers or some instrument, such as a hairpin, or a probe with an eye, or a watch-key with a rather wide opening. By this manœuvre the contents of the follicle are often obtained in the shape of a minute cylinder. When this is spread upon an object-glass and mixed with a drop of oil an acarus is frequently discovered. Frequently, also, the result of the examination of the first plug is negative, especially if the plug was very large; in such cases Küchenmeister obtained sometimes acari by a second stronger pressure; in the sebaceous matter which then issued he found them very easily. I have observed the same in the dog, and that the result of a first extraction contained no animals, while that of a second, with stronger and deeper pressure, brought them forth. In dead subjects the animals retire to the very bottom of the follicles, and can be obtained mostly by cutting through the skin.

Numbers and Mode of Life of the Demodex.—According to some authors, including Erasmus Wilson, but few men are free from these mites. They occur sometimes singly, sometimes several up to thirteen have been counted in one hair follicle. In hair follicles, into which small sebaceous glands open, the animals lie close to the hair; in the large composite sebaceous glands, into which small hair follicles open, the acari take up their position in the efferent duct of the gland, commonly nearer to the outlet of the duct than to the bottom, except in corpses, when, as already stated, the animals are found in the deepest recesses. The abdomen is usually directed towards the orifice, and the head towards the bottom of the gland; the reverse is rare. According to Küchenmeister, they continue to live for a considerable time, whether they are taken from the living or dead subject. If the mites are motionless, they may sometimes be made to move by the application of a gentle heat. But in all cases their movements are sluggish, and, according to my observations, confined to the jaws, which move strongest, the feet, which move less strongly, and the abdomen, which bends feebly to and fro. No locomotion on the object-glass was ever observed.

Treatment in Man.—Remak caused the patients to apply a mixture of equal parts of spirit of camphor and oil of turpentine; but after four weeks of this treatment, young mites

were still found; and three years later, the disease was as bad as ever. A popular remedy is essential oil of cinnamon. From my experience upon the dog, I think ointment of milk of sulphur very efficacious in destroying the mites, although it may not be able to reach all of them. Mercurial grey and ammoniated ointment may also be applied.

Treatment of the Demodex-mange in the Dog.—The skin of the dog was cleaned mechanically with the greatest care, combs narrow and wide, sponges and warm water being employed. All matted hair was cut away. All pustules were powdered with oxide of zinc, and then the entire dog was anointed with a mixture of equal parts of ointment of zinc and ointment of sulphur (Pharmacop. Britann.) Under this treatment, alternating with complete washing of the whole surface of the dog, bathing with much water, the disease abated, and then apparently disappeared. But the treatment must be continued for a long time, even when there are no pustules left, as relapses are liable to occur. The animal must be fed delicately on meat and bacon, and milk, and wrapped up according to the season, and bedded cleanly and tenderly. Of course, it must be kept isolated from other animals, and its head must be enclosed in a comfortable muzzle to prevent it from licking the ointment. In Scotland they consider the cure of a dog thus afflicted impossible, and kill the animal.

Transfer of the Demodex from the Dog to Man.—I was informed by the late Mr. John Telfer, steward to R. H. Elliot, Esq., of Clifton Park, Kelso, that some years ago he knew of a case where a deerhound got into the same condition as that described above, and *infected the keeper's daughter.*

Search after other Forms.—I searched the deerhound's surface in every imaginable manner, to find whether there were any mites present on the outside of the skin in a sexually-developed state, but not the slightest indication of anything of the kind was discovered.

History and Literature.

A notice of a mite living in pimples occurs in "Acta Eruditorum," p. 317, 1682—Schönlein. The figure of this mite given by Bonanni agrees better with the so-called Erdl's mite, or the bird-mite (Dermanyssus avium)—Schönlein and Remak.

The pimple-mites were discovered by Henle in 1841, and by G. Simon in 1842. Henle found them in the hair follicles

of the external ear, but mistook the tail for the head, and the feet for sucking discs composed of pads, such as characterise insect larvæ. Simon found them in the pustules of acne, and described them correctly.

In Griffith and Henfrey's "Micrographic Dictionary," 1856, p. 193, there is a statement to the effect that a species of demodex was found by Topping, the late well-known microscopic mounter, in the pustules of the skin of a dog affected with "the mange." This appeared to agree in structure with *D. folliculorum*, but its average size was less, amounting to $\frac{1}{150}$" to $\frac{1}{100}$" in length. My attention was directed to this notice by Mr. Norman, the microscopic mounter; I gave him a large supply of the mites, placed at his request in oil; but he found them so delicate that he did not succeed in making any permanent mount of them.

Literature and Synonyms.

The principal literary records concerning the mite are the following :—

Henle, "Ber. Zürich. naturf. Ges. in Beobachter aus der östiichen Schweiz," Dec., 1841.

Id. "Zeitschr. f. rat. Heilk.," Vol. iii., p. 28 (1845).

Gustav Simon, "Müller's Archiv." 1842, p. 218, with engravings.

Id. "Med. Zeit. v. d. Ver. für Heilk. i. Prussen," No. 9.

Miescher, "Verhandl. d. Baseler naturf. Gesellsch.," Vol. v., p. 191, Basel, 1843.

Erdl, "Gelehrte Anzeigen d. Kön. Bayr. Akad.," Vol. xviii., p. 143 (1843).

Wilson (*Erasmus*), *Lond., Edinb., and Dublin Philos. Mag.*, Vol. xxiv., p. 455, 1844; "Phil. Trans.," 1844, p. 305.

Gruby, "Archiv. génér. de Méd.," Avr. 1845; Abst. in *Edinb. Monthly Journal*, 1847, vii., p. 333.

K. Th. E. v. Siebold; Art. "Parasiten" in R. Wagner's "Handwörterbuch. der Physiologie."

Jul. Vogel, "Patholog. Anatomie," p. 410, and "Icones Histol. Patholog.," tab. xii. fig. vi."

Remak, "Diagnostische und pathogenet Untersuch.," p. 216 (ex Hoefle, "Chemie und Microscop am Krankenbette,") 1848, p. 45.

Küchenmeister, "Animal and Veget. Parasites," 2nd edit., Vol. ii., p. 15 (London Sydenham Society edit.), 1857.

Owen, R., Hunterian Lectures, i., p. 251.

Gervais, in Walckenaer's Aptères," iii., p. 282.

Tulk, "Ann. Nat. Hist." 1844, xiii. p. 75.

Wedl, "Grundz. d. Path. Hist." p. 803.

Synonyms.—Acarus folliculorum, *G. Timon*, "A. comedonum," *J. Vogel;* Entozoon (later). Steazoon folliculorum, *E. Wilson;* Macrogaster platypus. *Miescher;* Simonea folliculorum, *P. Gervais;* Demodex folliculorum, *Owen*, By the last name the animal is now generally indicated.—*The Medical Press.*

A DOG SWALLOWS A MEAT SKEWER. REMOVAL BY ABDOMINAL INCISION, AND RECOVERY.

BY VET.-CAPT D. C. PALLIN, A.V.D., LUCKNOW.

ON my return from the hills, where I had spent some leave last hot season, the Farrier-Major of the 16th Lancers informed me of a peculiar case brought to his notice during my absence. About a fortnight previously he was visiting one of the principal shops in Lucknow, when one of the assistants asked him to look at a favourite greyhound dog, the history of the case being as follows:—

The animal a few days before was being fed with hunks of meat, and through one of these a large "iron skewer" passed, which was unobserved, until it had been thrown to and caught by the dog. Difficulty at once being perceived in swallowing, and the end of the skewer showing in the mouth, every effort was made to recover it, but without avail; the animal escaping, ran away, and, in so doing, swallowed the lot. A few days passed without any apparent ill-results being exhibited, the appetite and passage of fœces remaining healthy. Meantime, however, the owner became most anxious about his canine companion, and therefore sought advice.

The most minute manipulation of the abdomen, etc., proved negative, with regard to the presence or position of the "foreign body;" but the Farrier-Major, notwithstanding his having grave doubts as to the correctness of the owner's story, lost no time in administering no less than four ounces of castor oil. The following day the patient presented a dull and dejected appearance, and the most profuse purging supervened. The evacuations were periodically examined, and no trace of hæmorrhage or irregularity, other than that caused by the physic, was visible; great disappointment, however, was displayed by the owner at the non-appearance of the skewer, frequent searches in the kennel being made for it.

In three days "Master McGrath" appearing in the best of health and spirits, he was taken for his usual hunt after jackal; this he went through, displaying the same swiftness and activity as he had always shown.

Shortly after the morning's exercise he was fed, and subsequently a pointed prominence became observable on the right side of the abdomen, close to the end of the last rib. This, on examination, was found to contain the point of the "skewer," but on very slight pressure being applied, it

receded and was lost, the dog apparently suffering no pain or inconvenience.

Nothing more was done until the dog was brought to the hospital a day or two after my arrival at the station. An ordinary double half-hitch twine muzzle being applied, the animal was cast, and I found that severe pressure on the near side brought the point of the skewer to the position already described. Considering this an unfavourable place to make an incision, I carefully manipulated until I worked it higher up and closer to the pelvis, gaining the exact spot which would enable me to puncture with safety, as in cases of equine tympanitis. I accordingly drew back the skin, and making a very small incision, cut down on the point. It at once protruded through the aperture for about two inches. This I seized, and with a strong sudden jerk, together with the patient making a bound, I was left sole possessor of the "skewer." The muzzle being removed and liberty allowed, the dog galloped about, showing little or no symptoms of pain, but apparently expressing delight at the relief obtained. No hæmorrhage took place from the wound, which was merely dressed with carbolized oil. Sloppy diet was ordered. Slight dulness and fever followed until the seventh day, subsequent to which complete recovery took place.

The skewer was seven inches long, and had a small hanging ring passing through an eye in the top. It is retained in the Section Station Veterinary Hospital.

(In the *Lancet* for August 11th, a very similar case is reported by a correspondent, who states that, on July 2nd, a small fox terrier was observed to have a swelling in about the situation of the fifth rib, and two inches from the spinal processes of the vertebræ. The "dog went off its appetite," and was evidently ill. On the morning of July 31st, a piece of wood was seen to be protruding from a sore in the same situation, and this the dog laid hold of with its teeth and extracted, drawing out a butcher's skewer $4\frac{5}{8}$ inches in length. When the correspondent saw the dog there was a sinus, from which a little blood still oozed. Much pus had previously escaped. The skewer was probably one upon which the cats' meat man had supplied the dog's food.—ED. *V. J.*)

CONTAGIOUS LIVER DISEASE IN CALVES.

BY D. HUTCHEON, M.R.C.V.S., COLONIAL VETERINARY-SURGEON, CAPE OF GOOD HOPE.

THIS disease of calves has been known on the coast districts of the Eastern Province for the last fifteen years. It was

reported first from the Peddie and Bathurst districts, whence it gradually spread to the districts of Albany, Alexandria, Victoria East, Fort Beaufort, and Bedford. It has recently appeared, also, in the East London districts.

Observation and experiment indicate that the disease is capable of being carried to a farm, or homestead, by calves affected with it, and it is generally believed that this is the principal means by which it is spread. Further, when once the disease has made its appearance amongst the calves on a farm, the infection has a tendency to remain there, and to manifest itself annually during the summer and autumn months, although it may be much more prevalent during some seasons than others, depending on the rainfall, and other climatic changes not yet understood.

As already indicated, experiment has shown that the disease is capable of being communicated to a healthy calf by the ingestion of the contents of the small intestines of a calf affected with the disease; and there is other evidence in favour of the opinion that the disease is ordinarily communicated by the fæcal discharges from the affected calves, which contaminate the veldt around the homestead, where the calves are generally allowed to run, but more particularly the water supply. In one herd of calves which I had under observation for some time, over twenty became simultaneously affected a few days after they were by accident allowed to drink out of a stagnant pool of water which was situated near the homestead.

The preventive measures, which are generally found more or less effective, also strongly support the opinion that the disease is contracted from the contaminated kraals, water or pasture. On some farms where the disease has been prevalent for several years the owners have reported that they were able to arrest it by placing the young calves when born in a clean uninfected kraal, and preventing them from leaving it, except to suck, until they were from five to six months old, providing them with food and pure water in the kraals during that time, and turning them away to the veldt some distance from the homestead when they were ultimately sent out to graze.

Mr. Borthwick, in his study of this disease, believed that he was successful in arresting its development by giving the calves two or three doses every week of hyposulphite of soda and sulphur.

On some other farms where the disease has been recently introduced and the infection presumably confined to the home-

stead and the veldt and water immediately adjoining it, the disease has been temporarily arrested by sending the calves away with their mothers to an out-station. In fact, the whole of the evidence points to the disease being an infectious one, and the probabilities are that the infection is contained in the excreta of the sick calves and spread very much in the same manner as the infection of typhoid fever is spread.

The symptoms and characteristics of the disease are briefly as follows:—The calf looks dull, and stands with its head depressed, its ears hanging, and the eyes have a languid look about them. The breathing is slightly quickened, and the temperature rises from 103° to 106° Fah. The discharge from the bowels is generally of a dirty greenish yellow colour; at first the fæces are of a doughy consistency, but later on they become more fluid, and have a most offensive odour. The appetite fails, although there is a considerable thirst; this thirst induces the calf to suck a little, but in a feeble and indifferent manner, and the milk so partaken of is neither digested nor assimilated properly. The patients will drink water freely, however, if allowed, and where pure it is apparently beneficial. The affected calves become rapidly emaciated and pitiable-looking objects, more especially those which survive the acute attack, and gradually pine away from inability to digest or assimilate the food.

The *post-mortem* appearances vary considerably, depending upon the length of time that the calf has been sick. When they die during the early stages of an acute attack, there is a congested condition of the blood vessels of the mesentery, the liver is also congested and enlarged, and of a dull yellow colour; on section, the dilated bile ducts can be seen. In some more advanced cases, the liver presents a saffron yellow colour, and the gall bladder contains a quantity of yellow-thickened bile, mixed with alternate mucus and flakes of inspissated bile. In still older cases, which have not been so acute in their progress, the liver is not so much altered in colour and appearance as a whole, but it contains numerous spots, more or less circular, and varying in size from a quarter to half-an-inch in diameter; these spots are studded throughout the surface of the liver, and penetrating through a considerable portion of the liver mass. These spots appear first as circles, a shade paler than the rest of the liver; they then assume an ashen hue, and ultimately a dirty dust colour, when their granular healthy structure is replaced by a sort of fatty degeneration. I have never seen abscesses form. In other cases again, even those that have been about the same

period ill, on making a section of the liver, there are none of these circular spots, the cut surface has a granular appearance, but it is studded throughout with circular pin-head spots, like thickened connective tissue, around the bile ducts and branches of the portal vein. A proper microscopic examination of such sections has not yet been made; the above is merely the appearance presented under a low magnifying lens.

With respect to the condition of the stomach and bowels, this varies very much; when the disease attacks a young calf fed on milk only, a quantity of curdled milk in tough cakes will very often be present in the fourth stomach, but this is most probably due to an arrest of functions of digestion, intensified by the fact that considerable thirst accompanies the onset and cause of the disease, so that the calf really sucks to slake its thirst after its power of digestion has ceased.

In older calves which have been grazing, the stomachs may be comparatively normal in appearance, except that the pyloric end of the fourth stomach is generally more or less congested. The mucous lining of the small intestines generally presents a catarrhal condition, especially during the acute stage. This is not so marked if the calf has lingered for some time. As a rule, also, the upper half of the small intestines contains chyme mixed with mucous and bile, the whole presenting a saffron-yellow colour and curdy appearance. The large intestines contain a variable quantity of fæces of a doughy consistency, a very fœtid odour and more or less of a clay colour. In some the colour is a bright yellow. But the *post-mortem* appearances differ, depending on the age of the calf and the stage of the attack in which the animal dies. In some of those cases which linger on for weeks and die from gradual emaciation, the liver is often found atrophied, and presenting a leathery appearance, its granular structure having almost completely disappeared. The liver is the principal organ affected, and the indications are that it is through the portal circulation that the poison enters, being taken in with the food and water. Respecting curative treatment, a great number of medicinal remedies have been experimented with, both by farmers and the veterinary staff, with varying measures of success; but under the most favourable form of treatment yet adopted, a large proportion of fatal cases has occurred. At one time I thought that I had found a fairly successful form of treatment in calomel combined with belladonna, followed by a dose of Gregory's powder, and succeeded by daily doses of some simple saline such as the bicarbonate

of soda, or the sulphate of soda. Messrs. Borthwick and Soga experimented with a variety of remedies, and considerable reliance on a mixture of chlorinated soda, hyposulphite of soda, and perchloride of mercury. Podophyllin resin and chloride of ammonia have also been tried in combination with belladonna and antiseptic agents, such as boracic acid and some of the tar derivatives. The nature of the disease appears to indicate that the most favourable results might be expected from a combination of cholagogues, anodynes, and antiseptic agents.

It is very evident that unless the liver is relieved, and the diseased action arrested in it at the early stages of the disease, medicine can do very little at a later stage, when considerable anatomical changes have taken place in it.

It has been unfortunate that hitherto none of the veterinary staff has been able to devote sufficient time to the study of this disease, to enable him to arrive at any reliable form of treatment, but it is to be hoped that Mr. Henning, who has been specially detailed to study the disease during the present summer, will be able to advance our knowledge in that direction, as well as in others. The farmers have not been slow to experiment themselves, and many medicinal remedies have had a temporary popularity—the last of these, I believe, are paraffine oil, common salt, and raw linseed oil. A great many of the patent medicines have also been tried; but what is desired is some reliable system of treatment, which only time and close observation can supply. With respect to preventive measures, it is very difficult for the veterinary staff to carry out any satisfactory arrangements for the disinfection of kraals or the complete isolation of infected animals, or any other sanitary precaution on the majority of farms, where the cows have to be brought to the homestead to be milked, and the calves have necessarily to be let out to suck and move about on infected ground. Yet it is clearly in this direction that our principal hope of being able to successfully cope with the disease lies. I think that the majority of farmers who have had much experience of the disease admit that it is infectious in some way or other. Such being the case, it becomes an imperative duty to treat it as an infectious disease, and adopt every known measure to prevent its spread to new centres and to arrest its further development where it has already manifested itself, as far as possible.

As has been already intimated, considerable success has attended various preventive measures when they have been thoroughly carried out. And it is also a well-known fact

that preventive measures, more or less successful, have been carried out for preventing the spread of other infectious diseases many years before the nature of the infective agent upon which they depended was known. How much more successfully now can such measures be relied upon, since, although we may not know the nature of each infective agent, our knowledge of the class generally is a very good guide to general measures.

It is folly, therefore, to refrain from adopting stringent preventive measures until we know all about the natural history of the originating cause of the disease. I am in hopes that the disease may not only be prevented, but entirely eradicated, if thorough measures could only be systematically and generally carried out. We will admit that the disease has contaminated the pasture and water on the farm, or, at least, a large portion of the pasture around the homestead, where the calves have been allowed to graze and run, but that contamination would most probably die out from the want of a proper host to feed on, if we could only succeed in keeping the calves away from the contamination for a year or two, because no other animal, so far as we know, takes this disease except calves. The plan which promises success, therefore, is something after the following:—At the commencement of the calving season, make a new kraal and clean and disinfect it properly. Into this kraal place every calf as soon as it is born, and never allow it out except to suck its mother, on clean or disinfected ground, until it is past the age when it is liable to contract the disease—after which it should be sent away from near the homestead to an outstation—or if kraaling is essential, let a kraal be made at some considerable distance from the homestead. Of course, food and water would require to be supplied to calves shut up in this manner. Calves shut up in a kraal without solid food of any kind, eat rubbish, and become affected with hairballs. Anyone attempting to keep his calves in the kraal in this manner, must therefore be prepared to feed them from the time they are about a month old. Tubs containing lime-water, frequently renewed, should also be kept in the kraal. The kraals should also be regularly cleaned out and disinfected. Should this succeed in arresting the disease amongst the calves, there would then be good grounds for believing that it could be thoroughly eradicated on a farm by continuing such precautions for some years, until the infection had died out. It is practically impossible for the veterinary staff to conduct such experiments except with the cordial

consent and co-operation of the farmers, and it is too much to expect the stock-farmer to hand over the management of his dairy cattle to the veterinary surgeon, to do with as he would like, unless under some special agreement. But it would require no veterinary skill to conduct an experiment such as I have indicated. What is wanted is thorough superintendence to see that no animal is allowed to stray, and if it does, it should not be allowed back with the other calves. In dealing with contagious or infectious diseases, the more thorough the measures, the more economical they are. It is half measures that are both disappointing and ruinous.

PLEURO-PNEUMONIA CONTAGIOSA.*

BY C. S. SMITH, M.R.C.V.S., HADDINGTON.

THE subject I wish to bring before your notice, viz.: Pleuro-pneumonia Contagiosa, is one which to veterinary surgeons is at the present time a source of great discussion. The learned professors of the day, as you are aware, have different opinions upon this subject. It is not my intention to go into minute details, for I am afraid if I did so, it would involve more writing than I care for, and perhaps more reading than you would care to listen to.

Pleuro-pneumonia Contagiosa is a contagious febrile disease characterised by specific lung lesions. It is peculiar to the Bovine species.

History.—According to Dr. Fleming, this disease first invaded Great Britain in 1841. The first outbreak we have any mention of occurred in Central Europe. In Algeria and Normandy this disease is unknown.

Cause of the Disease.—It is now supposed to be due to a micro-organism, which gains access to the lungs during respiration, where it causes engorgement of the lymphatic spaces. It has a period of incubation varying from two or three weeks to as many months. Principal Walley says it may extend to six months. This micro-organism has not as yet been clearly identified, as several organisms have been described by different bacteriologists, as causing this disease.

Symptoms.—We may divide these into two stages. In the first stage the manifestations are often not observable, on account of the slowness of the disease in developing itself. The thermometer shows the existence of the disease before any other indications are given, the temperature varying from

*Read before the Edinburgh Veterinary Medical Society.

102° to 106° F. Principal Williams has only found a few in which it has reached 107° F. The animal loses its appetite, the secretion of milk is diminished, there is an occasional cough, which is very characteristic of the disease, and rumination is suspended. The pulse is not of great importance in guiding us. On examination of the chest, there may not be anything to denote that the lungs are affected. The animal may remain in this condition for some days, and in some cases may gradually recover and be well again; but in most instances these are the subjects which convey the disease to other cattle. As the malady advances the cough becomes more frequent; the temperature decreases, and at the end of six or seven days becomes about normal; respiration quickens, and is more abdominal than thoracic; the elbows are turned out, and the nose is protuded, while the back is arched. The weight of the body is thrown upon the sternum when the animal is in a recumbent position. A grunt peculiar to this disease is heard. The bowels may be constipated, or there may be diarrhœa. On percussion of the chest wall the animal evinces pain, and there is dulness, which increases as the lung becomes more consolidated. On auscultation you hear friction sounds, due to the two roughened pleuræ rubbing against one another; also crepitations, due to changes brought about by inflammation of the lung substance. These sounds vary according to the extent of the consolidated areas.

In this disease both lungs may be affected, but this is very rare, as a rule one lung only is affected, and that the right.

Post-mortem Appearances.—On opening the chest we generally find on the affected side a quantity of yellowish fluid, containing a large amount of albumen, and flakes of lymph are seen floating about. This fluid, when left exposed to the atmosphere, soon forms a jelly-like mass. The pleura is thickened, and adhesions may unite the pleura pulmonalis to the pleura costalis. Upon one or both sides of the pleura there may be false membranes, which vary in accordance with the development of the disease. The affected lung or lungs, as the case may be, is larger, the specific gravity is increased, and the surface of the lung, instead of having a glistening appearance as in health, is dull; while the edges of the lung are rounded and covered with lymph. On cutting into the lung there is observed a peculiar marbled appearance; this is due to the extensive lymphatic exudation into the interlobular tissue, which appears as white bands. The reddish and greyish tinges are due to pneumonia. There may be a

patch of consolidation lying next to a portion of lung which appears quite healthy.

In regard to the marbled condition, the terms "red" and "grey hepatisation" are used. According to Steel, the congestion is followed by accumulations in the air-cells of lymphy deposit mixed with leucocytes, with proliferation, epithelial cells, and red corpuscles; these cause the firmness alluded to, and is the condition known as "red hepatisation," which is succeeded by the grey, in which case the number of epithelial cells and leucocytes are increased so much that they block up the air cells, and they then undergo fatty degeneration.

Course of the Disease.—This is a point of great importance. Authors do not agree as to which is the primary seat of the lesion. Principal Williams says it commences in the interlobular connective tissue. M. Delaforge is of the same opinion. Dr. Yeo and Professor Steel say that the bronchial mucous membrane is the point at which it commences. Dr. Woodhead regards the starting point as the epithelium of the air vesicles. Professor McFadyean comes to the same conclusion as Dr. Woodhead. Other writers say it commences in the pleura. The accepted theory is the first—that it commences in the interlobular connective tissue, and that it extends along the lymphatics. From the septa the lymphatic engorgement spreads to the perivascular and peribronchial spaces. This conclusion is arrived at, on account of our finding the vessels or bronchi near the primary seat being thickened and distended. The place of the lymph in old standing cases is taken by newly-formed fibrous tissue.

Microscopical Appearances.—The surface of the lung is covered by an exudate. There is partial or complete occlusion of the lumen of the bloodvessels and muscular coat may have undergone atrophy; this is well seen in cases of long standing. There may or may not be clots plugging up the bloodvessels. The pulmonary cells are obliterated, either by the surrounding pressure or deposits. It may be observed that this disease has a tendency, as Principal Williams says, of invading small groups of lobules, and in some cases attacking a single lobule only. The lymph which surrounds the lung, when examined, is found to consist of cellular elements, including leucocytes.

Treatment.—All I will say in regard to this is that every remedy which has been tried up to the present time has proved of no avail. As the Pleuro-pneumonia Act stands today, I am afraid that if a veterinary surgeon was discovered treating this disease, he would not be inclined to try again.

Methods adopted to eradicate this disease.—The three chief methods of dealing with this disease, as laid before the Departmental Committee, were:—First, isolation; second, inoculation; and lastly, slaughter.

In regard to isolation, those who are in favour of it say that it is not sufficient of itself, but that it should be accompanied by some other measure.

We now come to inoculation. A great many veterinary surgeons are in favour of this, and in places where it has been performed to any great extent, it has been attended with very good results. The operation as performed by Mr. Rutherford of this city, and described by Principal Williams, is as follows:—On arrival he examines the animals, and orders the slaughter of all affected, selecting one in the earlier stage of the disease for the purpose of providing the lymph, which, if good, is an amber-coloured fluid. This is obtained from the interlobular tissue of an affected lung. The part of the body to which the lymph is applied is the tip of the tail; this part is selected in case the inoculative action should tend to terminate in gangrene, and if this should occur, he amputates the tail. The hair is removed from the under surface of the tail for about four or five inches from the tip upwards. He then makes, with a pair of rowelling scissors, a transverse incision through the skin, about an inch from the point of the tail, and another about two or three inches higher up. A needle, with the eye at the point, is then pushed through from the lower to the upper incision. Then a piece of worsted, previously well-soaked in the lymph, is passed through the eye of the needle, which is withdrawn, and the worsted left in. If done neatly, the operation takes about two minutes, the pain being very slight. The indications that the operation has been successful begin to be manifested from the fourth to the seventh day. There is swelling, heat, tenderness and erythema of the end of the tail, and the parts assume a glistening appearance; in a day or two later there is an exudation of lymph. If you apply this lymph to a healthy animal, it will act as a preventive against the disease. In some cases there is a great tendency to gangrene of the part inoculated, and it is then necessary to amputate the tail and cauterise the stump with the hot iron. If the process goes on well, and no interference is necessary, either the inoculated portion falls off, or the inflammation ceases and the exudate dries up. No animal should be inoculated if suffering from any illness, or newly-calved. Animals which have been

inoculated, when exposed to the contagion, have contracted the disease and died. This is a point on which a great deal of argument is founded. Those in favour of the operation say that the animals did not take the inoculation successfully; but this is not admitted by the other side. It is also recorded that outbreaks have occurred on farms where all the cattle were inoculated.

Mr. Rutherford says that in two years the mortality attending his inoculations has not exceeded 1·5 per cent. In his evidence before a committee of the Highland and Agricultural Society of Scotland, he said that he had never failed to arrest an outbreak by means of inoculation, and he never knew an animal contract the disease after he had pronounced it safe. This evidence was challenged by Principal M'Call, of Glasgow, who said that when the disease broke out on the premises of Mr. Salmond, several animals became affected after he (Mr. Rutherford) had pronounced them safe.

Principal M'Call says that he approves of inoculation, provided it be performed on the animal before it has been exposed to the contagion; but he would be a bold man who would declare that he had not inoculated any animals that had contracted the disease by the natural method.

According to the evidence of M. Lameris, Government Veterinary Surgeon in Holland, compulsory inoculation was employed for three years, but his country was never cleared of this disease until the system of stamping out was adopted.

Slaughter.—The evidence brought before the committee proved that where this was properly carried out, it has always been successful in completely eradicating the disease.

The Board of Agriculture, in 1888, added a new clause, which I think was very important, viz.: That all cattle, being or having been in the same field, shed or other place, or in the same herd, or otherwise in contact with cattle affected with pleuro-pneumonia, are to be slaughtered within ten days. By this act it is an impossibility for the disease to spread.

Sanitary Measures.—The objects of these measures are two: 1st, to prevent the transmission of the disease to animals in a country in which it has not yet appeared; 2nd, to eradicate it when it has manifested itself. In regard to the first, cattle should not be imported from a country where the disease exists. They should be examined by a veterinary surgeon before being taken on board ship, and should undergo another examination before being landed. All railway waggons used for the conveyance of cattle should be cleansed,

dried, and disinfected after being used. The second consists of disinfecting the premises after slaughter. Washes of quicklime should be applied to the walls and woodwork, after chlorine or sulphuric acid disinfection; doors and windows should be kept open for a few days, and no cattle should be allowed to occupy them for at least 14 days. The litter, forage, &c., should be burned or buried with quicklime.

In conclusion, I will give you a few particulars of an outbreak which occurred two years ago. On June 14th we were called to see a cow, the property of the Barnsley British Co-operative Society. On our arrival she presented the following symptoms: Head elevated, nose extended, breathing painful and accompanied by a grunt, and her elbows were slightly turned out. On the right side, the ribs were pushed further out than those of the left. On a closer examination, she had a small wiry pulse, ears and horns varied in warmth, the temperature was 105° F., and a cough was heard. On percussion, she evinced pain over the region of the right lung. Auscultation: A large portion of the lung was found to be consolidated.

On making inquiries, we learnt that she had been unwell for some time, that she had gradually lost her appetite, the secretion of milk was diminished greatly, and there was diarrhœa. From the above symptoms, my father had no hesitation in wiring to the Board of Agriculture, informing them of the existence of a case of pleuro-pneumonia. A telegram was received next day, ordering the beast to be valued and slaughtered, and the lungs to be forwarded to the Royal Veterinary College, London, which was done. While we were waiting the result, three more animals began to show symptoms. A message was received from Mr. Cope, saying that this was a genuine case of pleuro-pneumonia, and that a travelling inspector would be sent down at once.

There were fifty-five head of cattle on the farm. When the animals were slaughtered, the three before mentioned were all found to be affected. On the last day of slaughter, an Irish beast, which had been purchased at Doncaster nine months before, and had never given any signs of illhealth, was found to have a large cyst in the right lung. Upon opening it, there was found a rounded piece of lung, which was completely detached from the healthy portion. Upon a section of this being made, the characteristic marbled appearance of pleuro-pneumonia was very distinct. This, we concluded, was the animal who had brought the disease on to the farm.

Editorial.

THE MYSTERIOUS DISEASE IN CANADIAN CATTLE.

A YELLOW Parliamentary book has just been issued containing further papers and correspondence relating to the landing in Great Britain of Cattle, and a minute of the Board of Agriculture dated August 13th, as to the special inquiry which was recently instituted by it, as to the nature of the malady affecting certain of the cattle sent from Canada, and found to be diseased when slaughtered in this country. In this minute we obtain for the first time a history of the more recent occurrences which have given rise to the inquiry, and are placed in a position to judge of the reasons for the action of the Board, and of the value of the evidence brought before it.

The Board state that they determined, so soon as the trade of the year 1894 had fairly re-opened, to again make arrangements for a special examination of the lungs of all cattle imported from Canada for slaughter at the port of landing, and it was suggested by the present chief veterinary officer of the Board that, in the event of the detection of any further cases of disease, competent pathologists and veterinarians should be invited to examine and take notes of the appearances presented while the lungs were still fresh, an accurate diagnosis being greatly facilitated by an examination of the diseased portion as a whole at the earliest possible moment. By this means the Board hoped to secure ample material upon which to base their future action, should further cases of disease among Canadian cattle be discovered at the ports, a contingency which, unhappily, occurred very soon after the special examination of lungs commenced.

On 20th May an animal shipped from Montreal twelve days previously by the s.s. *Toronto* was landed at Liverpool, and it was slaughtered on the 23rd May. The lungs of this animal were declared by the inspector, Mr. William W. Smart, to present the characteristic appearances of pleuro-pneumonia. These lungs were forwarded to London, and on examination the opinion of Mr. Smart was confirmed by Messrs. Cope and Duguid, the Board's chief and assistant veterinary officers respectively, and subsequently by Professor G. T. Brown, C.B., consulting veterinary adviser to the Board. Nine gentlemen were thereupon invited to attend at the offices of the Board for the purpose of inspecting the diseased portion of the lung, and they were asked to make careful notes of the appearances presented. They were as follows:—Professor John F. McFadyean, Dean of the Royal Veterinary College; Professor William Williams; Mr. F. R. Ingersoll, veterinary inspector, London County Council; Mr. S. J. Rayment, veterinary inspector, Metropolitan Cattle Market; Dr. Francis Vacher, medical officer of health, Cheshire; Dr. H. D. Littlejohn, Edinburgh; Dr. G. Sims Woodhead, director of the Research Laboratory; Mr. William Hunting, veterinary surgeon, London; and Mr. Clement Stephenson, F.R.C.V.S., Newcastle.

Professor Williams, Dr. Sims Woodhead, and Mr. Hunting had been asked by the High Commissioner for Canada to make reports to him regarding some of the previous cases to which the Board have above referred.

The Board subsequently, by desire of the High Commissioner, extended a similar invitation to Professor J. M'Call, Glasgow; Professor J. Macqueen, Royal Veterinary College; and Mr. R. Rutherford, F.R.C.V.S.; and they also asked Mr. S. G. Holmans, their senior inspector at the foreign animals' wharf at Deptford, to examine the specimen. All these gentlemen were able to accept the Board's invitation, with the exception of Professors Williams and M'Call, who were unable to leave Scotland in time to admit of an early examination of the diseased lung.

Subsequently to the landing of the *Toronto* animal, five other cases of disease were detected by inspectors at Liverpool, Deptford, and Glasgow, amongst cargoes of cattle arriving from Canada, the disease being declared by those inspectors and by the veterinary surgeons of the Board to be in each instance contagious pleuro-pneumonia.

With a view to avoid any possible confusion of specimens and the unnecessary complication of the scientific question at issue, the Board did not at first propose to make arrangements for the examination of any of the specimens in these five cases by professional gentlemen not in the service of the Department, but the Board subsequently determined somewhat to extend the evidence at their disposal, and they invited the following gentlemen to examine the lung of the animal landed by the *Mongolian* at Liverpool:—Professor John F. McFadyean, Mr. F. R. Ingersoll, Mr. S. J. Rayment, Dr. G. Sims Woodhead, Mr. Wm. Hunting, Professor J. Macqueen, and Dr. Armand Ruffer, M.D., F.L.S., together with the senior inspector at the port of London (Deptford), Mr. S. G. Holmans.

Each of these gentlemen had also seen the *Toronto* lung, with the exception of Dr. Ruffer, whose name had been suggested by the High Commissioner of Canada too late to permit of his being invited to examine the specimen in that case. It was decided to take a *viva voce* examination of the scientific evidence thus available, and the Board obtained the assistance of Sir Henry James, M.P., and Dr. J. Burdon Sanderson, Waynflete Professor of Physiology in the University of Oxford. The Board sat with their assessors on four separate occasions.

It is difficult to understand why certain of these gentlemen, medical and veterinary, were called as witnesses, as they had certainly little experience of the disease, and could, therefore, give no reliable information as to its pathological anatomy.

The minute gives a summary of the general conclusions of the witnesses as to the nature of the disease, so far as it could be ascertained from the appearance of portions of lung; but it would be well for those who desire to learn more of the opinions of these to procure the Yellow Book.

Mr. Smart "had no doubt" in his own mind about either case. He was convinced the disease was pleuro-pneumonia.

Dr. Littlejohn recognised the *Toronto* case "at once as contagious pleuro-pneumonia." He "had no doubt about it."

Professor McFadyean would not like from his examination of the two lungs to say that he considered them to be cases of pleuro-pneumonia, but, on the other hand, he was quite unprepared to say that the disease was not pleuro-pneumonia. The description of pleuro-pneumonia given in various text-books applied to the two cases, but it might be that those descriptions were not minute enough to enable it to be distinguished from other diseases which resembled it as regards the naked eye anatomy, and he would like simply, on

that account, to safeguard himself. He was quite positive, however, that the disease, if not pleuro-pneumonia, was "a bacterial or germ disease," and he "had never seen such lesions as were present in these lungs in British cattle except in pleuro-pneumonia."

Professor Macqueen did not think the *Toronto* lung was "a lung of contagious pleuro-pneumonia," but if he were acting as port inspector he would "certainly look upon the case" as a "suspicious disease," although "the clinical history of the whole of the cases did not point to its being a contagious disease." On further examination, Professor Macqueen stated that he did not see much to distinguish between what was actually observed in the *Toronto* case and the early stage of the true disease, and it was for this reason that he said it was "a suspicious case—a case of doubt."

Mr. Hunting would not say that there was any one symptom of those described in Professor Brown's report on the *Toronto* case which was inconsistent with the existence of contagious disease, and, apart from the deficiencies to which he subsequently referred, he would have said that the case was one of suspicion. On the supposition that he was a tenant-farmer possessed of a very valuable herd of cattle, Mr. Hunting said that he would most distinctly have declined to have put cattle in the same condition as the *Toronto* animal among the herd and have run the risk. Still less, he said, would he like to do it for his neighbour, and still less would he like to do it if he were a "Minister holding a responsibie position for the British public."

Mr. Rutherford expressed the opinion that the lesions in the *Toronto* case were "undoubtedly those of a pneumonia—strongly resembling, if not actually, contagious pleuro-pneumonia in an early stage of the disease."

Mr. Stephenson said, with regard to the *Toronto* case:—"In my opinion, there can be no doubt it was contagious pleuro-pneumonia. I would like to add to that, that if, under the old *régime* when I was acting for the county, I had found such a piece of lung in my professional work I should have considered without any doubt I had an outbreak of pleuro-pneumonia to contend with, and, as soon as possible, I would have got the machinery to work to stamp it out. There is no doubt about that."

Mr. Ingersoll expressed a similar opinion. He felt positive that the disease in the *Toronto* and *Mongolian* cases was contagious pleuro-pneumonia, and if the cases had come before him and it had depended upon him whether he would have condemned them as contagious pleuro-pneumonia, he would have done so decidedly.

Mr. Rayment stated that if he had seen the *post-mortem* appearances present in the *Toronto* and *Mongolian* animals, he would "certainly have said they were distinctive of contagious pleuro-pneumonia, and contagious pleuro-pneumonia alone."

Dr. Ruffer did not like to pledge himself to saying that the *Mongolian* case was a case of pleuro-pneumonia, but he would not say that it was not contagious pleuro-pneumonia, and the appearances which he saw did agree, generally speaking, with the descriptions given in the text-books.

Professor M'Call stated that if, in the performance of his official duty, he had found appearances in the lungs of Scotch cattle similar to those described in the reports of the veterinary officers or in the picture of the *Mongolian* specimen which had been submitted to him, he would decidedly not have considered himself justified in advising the local authority to deal with the disease as anything else but contagious pleuro-pneumonia. He would have had no hesitation in regard to the matter.

The opinions of the veterinary officers of the Board as to the character of the disease are sufficiently stated in their official reports, but it may be added that, in reply to questions addressed to him, Professor Brown stated that he was as positive that the disease which he saw in the *Toronto* and *Mongolian*

animals was pleuro-pneumonia as he had ever been in regard to any case of pleuro-pneumonia which he had ever seen. He was as confident that it was pleuro-pneumonia as he would be that a person was suffering from small-pox if he saw pustules on his face. "Indeed," Professor Brown added, "I think I should be more confident, because I know more about pleuro-pneumonia than I do about small-pox."

Elsewhere we have given the conclusions at which the Board of Agriculture has arrived, and it must be confessed that if the Canadian authorities have not made a mistake the disease is as mysterious in its nature as before this inquiry was instituted. Contagious pleuro-pneumonia does not arise spontaneously, and could not be generated during the voyage across the Atlantic; therefore, if the two cases found among the hundreds, nay thousands, of cattle imported from Canada were really affected with that disease, it follows that the contagion must be present in the Dominion. This, however, is strenuously denied by the veterinary experts in Canada, who assert they have made every inquiry and can find no trace of it, and they have personally visited the place whence the diseased cattle started from. The malady is certainly one that cannot be concealed for many months, and in such an extensive cattle-rearing region the havoc it would cause would quickly attract attention, even beyond the bounds of Canada.

In such a hotly-contested and gravely-important question, surely every possible means ought to have been adopted to arrive at a satisfactory conclusion as to whether the two cases were Contagious Pleuro-pneumonia; for it is evident that the appearances presented by the specimens of lung examined could not have been altogether reliable, else there would have been more unanimity among the skilled experts who examined them. But the English authorities, having once committed themselves to the opinion that the existence of the disease can be decided by its pathological anatomy alone, avoided allusion to the other tests that might, and ought to have been applied. One of the witnesses (Mr. Rutherford) mentioned that, according to his very large experience, "an invaluable and certain mode of satisfying ourselves whether this is a contagious form of pneumonia or not, is by inoculation and cohabitation," and was promptly answered by the President of the Committee, Mr. Gardner, M.P., President of the Board of Agriculture), "we cannot go into that now." And it was not gone into at all.

The question of contagious pleuro-pneumonia in Canadian cattle therefore remains pretty much in the same condition it did before this expensive inquiry was instituted, and it is

difficult to say how it is to be settled. Certainly the position is not satisfactory, if the lung appearances are alone to be relied upon in the case of cattle coming from a country which is positively declared to be entirely free from the disease. Surely the advantages of clinical observation and experimental pathology might be made available in such a serious matter.

BACTERIA: THEIR NATURE AND FUNCTION.

BY PROFESSOR E. KLEIN, M.D., F.R.S.

(*Continued from page* 117.)

THIS organism, as a first and important action, peptonises albumin and liquefies and peptonises gelatine; then this peptone is decomposed, yielding, amongst other substances, leucin, tyrosin, indol, skatol, phenol, and, further, ammonia.

(*b*) *Bacillus coli.*—The normal inhabitant of the intestine of man and animals is another powerful albumin-decomposing microbe, but, unlike the proteus, it decomposes albumin without first converting it into peptone; it therefore does not liquefy gelatine like the proteus; it rapidly decomposes albumin, forming indol and allied bodies, and even ammonia.

Bacteria causing Ammoniacal Fermentation of Urea.

In connection with these true putrefactive bacteria I must mention a group of bacteria which, though not strictly connected with decomposition of albuminous matter, play an important part, inasmuch as their action supplements that of the former, the group in question consisting of species which can change urea and allied substances into ammonium carbonate. This action is generally and justly considered of the nature of a ferment or hydrating action, like that of other organised ferments to be presently described. But we mention this group here because by changing urea into ammonium carbonate it prepares, in one sense, the way for the action of certain other bacteria which, by oxidising ammonia into nitrites and nitrates, are the direct food-providers for the vegetable kingdom. Urea and allied substances, as stated above, are the last products of albuminous metabolism in man and animals, and, therefore, form an integral part of the material destined for the soil in which the plants of our gardens and fields live and thrive. I showed at this stage one of the species of this group—for there are several—the *Micrococcus ureæ*; this is a coccus growing as a white staphylococcus, and forming connected masses in the natural or artificial culture media; it does not liquefy gelatine, and grows extremely rapidly at higher temperatures.

Photographs give an idea of the character of this organism in plate, in streak, and stab-culture, and in microscopic specimens; in these latter it is noticed that neither in size, nor arrangement, nor mode of division does this microbe show anything that would distinguish it from other species of staphylococcus; its action on urea is its chief distinguishing character, as it is capable of converting it into ammonium carbonate.

At present it is well established that nitrogenous principles like indol, phenol, and ammonia are produced during the decomposition of albumin by proteus, *Bacillus coli*, and other putrefactive bacteria; and, further, that substances, as indol, phenol, and the like, are, by the activity of certain other bacteria not yet sufficiently investigated, converted into ammonia. We have now traced the decomposition of albumin down to ammonia, and in this condition it is subjected in the soil to the action of the *nitrifying bacteria*—that

is, bacteria which oxidise ammonia, and convert it into nitrites, and ultimately into nitrates; these bacteria complete then the series of processes by which the nitrogen ultimately returns from where it started. It started as nitrates in the soil surrounding the roots of plants, and as nitrates it ultimately again finds itself in the soil; first it had been used by the plant in order to build up its albumin, then as vegetable albumin it represents the food of animals; in these it serves to build up the protoplasm of the animal body, from which it passes as food for carnivorous animals. The albumin of animals or plants becomes decomposed by putrefactive bacteria, the ultimate product of this, ammonia, becoming converted by the nitrifying bacteria of the soil into nitrites, and finally into nitrates. "From earth to earth" expresses the beginning and end of this wonderful migration and change.

Nitrifying Bacteria.

Schlœsing and Müntz were the first to show that the conversion of ammonia into nitrates in the soil is most probably caused by micro-organisms, but not till the researches of Warington, Winogradski, and P. Frankland were these micro-organisms isolated and more carefully experimented with. Warington, and particularly Winogradski, have shown that there are two species of bacteria which play an important part in these processes, one species converting ammonia into nitrites, the other converting these finally into nitrates. Some lantern slides of Winogradski were here exhibited, in which these two species are well shown; the slides are of preparations of artificial cultivations, in which Winogradski has been extremely successful. These two species (the nitrous and the nitric organism), are minute rod-shaped or oval bacteria; when in the act of dividing, they form short dumb-bells; the nitrous organism is larger than the nitric, but both show forms which possess cilia, and which, therefore, are possessed of motility. Winogradski has by artificial cultivations obtained both these species in large quantities, and on testing them on liquids of suitable composition, found that the one is capable of converting ammonia into nitrites, the other these latter into nitrates. There can then be no doubt that the problem of the manufacture on a large scale of these nitrifying microbes, so important for agriculture, must be considered as solved.

Bacteria of Leguminosæ.

I have next to bring to notice a group of organisms which, like the former, are of interest and importance to the vegetable kingdom, at any rate to one portion of it, viz., the plants belonging to the natural order Leguminosæ.

Hellriegel and Wilfarth had shown that the excess of nitrogen in the Leguminosæ is obtained from the atmosphere by the instrumentality of bacteria in the soil around the roots of the leguminous plants; that these bacteria "fix" the free nitrogen contained in the soil, derived, of course, from the atmosphere; and that, if the soil be sterilised, by which the bacteria are killed, no fixation of nitrogen can take place, and the growth of the leguminous plant remains appreciably attenuated. The roots of luguminous plants growing in the ordinary soil are known to possess numbers of nodular growths. These nodules have been thoroughly investigated by a large number of observers, and their importance in the process of fixing the nitrogen, and in the proper development of the plant, has been satisfactorily worked out; foremost amongst these stand the investigations of Marshall Ward, of Sir John Lawes and Sir Henry Gilbert, of Beyerinck, Prazmowski, Nobbe, and Frank. Beyerinck, then Prazmowski, and particularly Nobbe, have shown that the nodules on the roots owe their origin to the growth in the tissues of the root of certain bacteria, and it is these bacteria which are instrumental in fixing the free nitrogen. These bacteria represent well-defined species, and, as Nobbe has shown, differ for the different Leguminosæ.

Photographs were shown to illustrate the distribution, in the tissue of the nodules on the roots of lupines, of particular species of bacteria, then the character of these bacteria under cultivations, and their aspect and size in microscopic specimens. This species of bacilli is composed of motile cylindrical rods, which, cultivated in gelatine, liquefy this, and produce in the liquefied gelatine a peculiar greenish fluorescent colouring; on agar they also produce this colouring. The nature of the young colonies in plate cultivation, their manner of spreading and swarming, are well shown in such photographs.

Chromogenic and Phosphorescent Bacteria.

The remarkable species of what are termed chromogenic bacteria have the power to produce pigments, either pigments which become dissolved in the medium in which these bacteria grow, or which remain limited to the substance of the bacteria themselves. Species of bacteria, there are, which produce pigments of scarlet, red, orange, yellow, yellow-green, green, greenish-blue, blue, violet, or pink colour. The nature of these pigments, and the meaning and object of their formation, are still shrouded in a good deal of mystery, though Erdmann and Schrötter showed long ago that many points of similarity exist between some of these pigments and certain analine colours. *Bacillus prodigiosus* is the more common of the chromogenic bacteria, being occasionally present in water and in air. The pigment is soluble in alcohol, though only to a limited degree.

I can only make a brief reference to another remarkable group of bacteria, which comprises several species, all having the power to produce luminosity of themselves and the medium in which they grow. These phosphorescent bacteria have been long known (Pflüger) to be concerned in the production of the phosphorescent condition of decomposing sea fish, but within recent times Ludwig, Fischer, Katz, and particularly Beyerinck, have studied more in detail the conditions under which these bacteria grow, and have identified and cultivated several species. Dr. Beyerinck has sent me one species of these phosphorescent bacteria, the elements of which are short oval rods, often dumb-bells; they grow in fish broth, and when the growth becomes conspicuous to the unaided eye it is luminous when viewed in the dark. Some cultures were exhibited which, when placed in the dark, showed a beautiful phosphorescent appearance. The phosphorescence is more or less limited to the surface layer, that is the one in contact with the oxygen of the air; in the depth it is absent, but when shaking the flask the phosphorescence appears also in the depth.

Fermentation.

I have mentioned, in connection with a previous group, bacterial species which have the power by hydration to change urea into ammonium carbonate, a change which is called a fermentative action. Changes similar to these are caused by micro-organisms in many processes playing an important part in industries. Amongst these changes I may mention one in particular, the souring of milk. There are a good many others, the viscous or mannite fermentation, the butyric fermentation, the indigo fermentation, the dextran fermentation, the acetic acid fermentation, and others; but we must confine ourselves to the description of one, viz., the common *Bacterium lactis*. It is a minute oval bacterium, which multiplies with great rapidity, and which, introduced into milk, turns this sour in 12 to 24 hours at the ordinary temperature; when sterile milk is inoculated with this bacterium, and kept in a warm place at a temperature of 60°—65° F., the milk is found solid and curdled before 20 or 24 hours are over, and in this curdled milk large numbers of the *Bacterium lactis* are present, either as

dumb-bell ovals or as short chains. When a needle is dipped first into such curdled milk, and then into normal milk, the same coagulation, with the same appearances, takes place in the latter. When a plate cultivation of such milk is made it is seen that a large number of colonies, all of the same character, are developed, which colonies are made up of the *Bacterium lactis*; through, however, numerous generations this organism is cultivated in artificial cultivations—it grows well on nutritive gelatine to which whey or only lactic sugar has been added—if it is then transferred to fresh milk, it always produces this souring and curdling; that is to say, it changes lactic sugar into lactic acid, and as this is being formed it coagulates and precipitates the casein of the milk. With a trace of milk that has gone naturally sour—that is to say, to which the *Bacterium lactis* has found entrance, and in which by its multiplication it has produced curdling, any amount of normal milk can be successively turned sour and curdled.

Bacterium lactis is not by any means a rare organism; it is widely distributed, and can at any moment, in dairies and other places, through impurities of the utensils, by dust, &c., find access to milk, which would soon succumb to its attacks. When, for instance, in dairies or in one or another locality, the milk has a frequent tendency to turn sour, this means that the *Bacterium lactis* has taken firm footing in such a locality. It is well known that only extreme measures of cleanliness, thorough boiling of all utensils and vessels, cleaning of walls and floors, can banish or reduce it. In this the analogy with an epidemic of an infectious disease is obvious. Just as in an epidemic, every susceptible individual to which the contagium has had access becomes smitten by infection, and just as in an epidemic the contagium of the disease, being of wide distribution, and having taken a firm hold of the locality, attacks an increasing number of individuals, and thus causes the epidemic—so also in the case of the *Bacterium lactis*: when this has taken a firm hold of, and has acquired a great distribution in any locality, any sample of milk (*i.e.*, susceptible individual) may take the infection, either by coming in contact, directly or indirectly, with a trace of the milk already infected, *e.g.*, by being placed in vessels in which infected milk has been kept previously, or becoming infected through dust charged with *Bacterium lactis*, or coming in contact with water poured from a vessel in which traces of the microbes were still left. All this finds its complete analogy in the case of an epidemic infectious disease. The fermentative processes due to microbic activity, and playing an important part in industries (alcoholic and other fermentations), illustrate in a very striking manner some of the essential features observed in the nature, in the production, and in the spread of infectious diseases in man and animals. The fermentative processes, thoroughly established as being due to microbic activity by the researches of Pasteur, were by Pasteur, and others after him, used as illustrations of the way in which infectious disorders in man and animals arise, and it was exactly these considerations which led Pasteur to his brilliant studies of these diseases, the results of which studies have been of such signal service in sanitary science in general, and in the prevention of infectious diseases in particular.

In the fermentative processes studied by Pasteur and others, it was shown that each specific fermentative process is due to the growth and multiplication of a specific microbe. Just the same is the case with the infectious diseases—when from a substance which is in the process of fermentation, a trace containing the particular microbe is introduced into fresh fermentable substance, this latter undergoes the same fermentation; further it is shown that, however great the number of accidental non-specific bacteria which may be introduced at the same time, unless that particular bacterium be present amongst them, the specific fermentative change does not ensue. The same is the case with infectious diseases: the number of non-specific bacteria in

water, dust, air, various common articles of food, etc., is sometimes great, but no amount of these would set up any of the infectious diseases, like cholera or typhoid fever, tetanus or diphtheria; in order to do so there must be amongst them the particular microbe of cholera or typhoid fever, etc. Again, in each fermentative process the substance which is to undergo the fermentation must be susceptible of the particular fermentation: a substance that contains sugar can undergo the alcoholic fermentation, a substance that contains alcohol can undergo the acetic acid fermentation, etc. The same is the case in the infectious diseases: an individual must be susceptible to the disease, though it is not quite clearly established what the meaning of this is. Further, just as in the fermentative process the susceptibility of the substance alone is not sufficient, is only a preliminary condition, the actual infection with the specific microbe being the essential, so also in the infectious disease: in order that a susceptible individual should become the subject of the disease, it is essential that the specific microbe should be present and should find entrance into this susceptible individual. Just as little as a particular condition of the atmosphere, of temperature, &c., is capable of producing the souring of milk, so also a particular atmospheric or telluric condition, season, or other external circumstances alone cannot produce an infectious disease. What is wanted in the first place is the presence of the *Bacterium lactis* in the one, the specific pathogenic microbe in the other; atmospheric or telluric conditions may and do favour the more rapid multiplication and dissemination of the *Bacterium lactis* or other specific microbes, but without the presence of the specific microbes these processes could not take place. "Thunder in the air" could not turn the milk sour, could not make meat tainted, could not turn beer or wine sour, without the presence of the specific microbes, which by their presence and multiplication produce those undesired changes in these substances; the particular condition of the air could and would increase their rate of multiplication and distribution, and therefore increase the chances of infection of these substances, and consequently a more conspicuous manifestation of the effects of the activity of those microbes, but it could not produce the microbes themselves.

Pathogenic Bacteria.

The different pathogenic bacteria connected with and causing the different infectious diseases have, then, the power of growing and multiplying within the infected individual and, through the different poisonous substances—toxins—which they therein produce, of causing the changes which characterise the particular disease.

Photographs of a variety of such pathogenic bacteria serve to show that both as regards the manner of distribution of these bacteria in the tissues of the infected individuals, as also in their morphological and biological characters in artificial cultures, most of them are sufficiently distinguished from one another and from other non-pathogenic bacteria. In considering the general action of pathogenic bacteria we find that they may be arranged in two groups:—

a. Such as are entirely, so far as our knowledge at present goes, dependent on the living body of man or animals. These are *endogenic* bacteria or true parasites, for they do not appear to lead an existence independent of the living body. When, therefore, infection by them takes place, it is effected by direct transference from an infected individual to a new one; this is so in small-pox, in vaccinia, and in hydrophobia.

b. A second group comprises those which are capable, besides a parasitic life, *e.g.*, growing and multiplying within the animal body, of leading also an existence independent of the animal body: that is to say, they, like many other non-pathogenic bacteria, are capable of thriving in suitable materials in

the outside world; such are anthrax and fowl cholera, Asiatic cholera and typhoid fever, tetanus and diphtheria, and others. But also amongst these some can lead such an *ectogenic* life comparatively easily, while others do so only in a restricted sense. While, for instance, anthrax, tetanus, typhoid fever can lead such ectogenic life easily, *i.e.*, growing, and multiplying outside the animal body, others, like tubercle and glanders, do so only to a very small extent. The former are obviously the more dangerous to man and animals, on account of their more ready distribution, than the latter, of which the ectogenic existence is considerably restricted by various conditions, *e.g.*, they require higher temperature to grow at, and they require a much more specialised nutritive medium than is generally attainable by them.

Many and wonderful are the results which have been obtained within a comparatively short recent period, by a large number of workers as regards the identification of many of the pathogenic bacteria, their habits of life, their mode of spread and infection; the way in which their action can be attenuated, their effects weakened, and such weakened cultures used for protective inoculations;—the brilliant results achieved by Pasteur and many others in these protective and curative inoculations against anthrax, against fowl cholera, against tubercle, against hydrophobia, against tetanus, and other diseases.—*Journal of the Royal Agricultural Society of England.*

VETERINARY MEDICINE IN SWEDEN.

In order to acquire the designation of Veterinary Surgeon in Sweden, it is necessary to have studied at the Stockholm Veterinary Institute, and to have undergone a satisfactory examination. But before being allowed to enter the Institute, the candidate must possess the diploma of a superior school as a guarantee of proficiency in general education.

The period of study in the Institute is four years, each of them being divided into two terms or sessions—from August 15th to December 15th, and from January 15th to June 15th. There are special professors for: 1, Anatomy and Physiology; 2, Management of Domestic Animals; 3, Surgery and Obstetrics; 4, Pathology and Therapeutics; 5, Histology, Pathological Anatomy, and Bacteriology.

In addition, there is a teacher of botany, physics, chemistry, materia medica and pharmacy, and another who gives practical instruction in shoeing.

The Government maintains a veterinary surgeon in each province of the kingdom; while the provincial governments and the agricultural societies in their turn, nominate and guarantee a certain annual income to district veterinary surgeons.

There is also a school of farriery at Skara, where civil and military shoers are instructed; this school is attached to a hospital for domestic animals, and here those who attend the shoeing classes also receive practical instruction in the treatment of the less serious diseases and accidents. Those who hold the diploma of this school have the right to prescribe for remedies wherewith to treat animal diseases, the prescriptions being made up by pharmaciens, but they cannot be employed as official veterinary surgeons, neither are their certificates valid in the case of epizootic diseases.

IMMUNITY.

Buchner (*Münch. med. Woch.*, June 12th and 19th, 1894), discusses the advances in this subject. In connection with the exact causes of immunity, the great difference between natural and acquired immunity has been definitely

established. Natural immunity seems to be brought about by the bactericidal action of a protective substance or alexin in the blood serum. This alexin differs from the antitoxin found in the serum of animals artificially made immune. Alexin acts upon the bacteria, and also upon the red cells, and even leucocytes belonging to animals of other species, whereas such bactericidal and globulicidal action is not possessed by antitoxin. Alexin is most easily decomposed, whereas antitoxin is a stable body. The effects of antitoxin are the same, whether coming from one animal or another, and only depend on the degree of acquired immunity possessed by the animal. The author contends that the serum of animals made immune contains both alexin and antitoxin. Thus a body can be extracted from the blood serum of an animal made immune and can be transferred to another. There are two explanations in regard to this body—namely, that it is a reactive product on the part of the tissues, or a modified product of the bacteria cell. The chief point, however, is that the living body is necessary for the production of this antagonism of the antitoxin against the cause of the disease. The author would limit the term immunity to the acquired form, and thus speak of specific immunity, including the immunity against the bacteria poison, and of natural resistance. The action of tuberculin does not lie in any specific immunity, but in an increased natural resistance. In this respect he refers to the researches of Hueppe in relation to cholera, and those of Fraenkel and Rumpf, in relation to the treatment of enteric fever by killed cultures. The author maintains that endeavours are being made in the protection against disease by increasing the natural resistance. He then quotes an experiment in which sterilised wheaten gum was introduced into the pleural cavity of a large rabbit. After it was killed the gum was found infiltrated with leucocytes and possessed of marked bactericidal powers against the B. coli communis. The leucocytes were destroyed by freezing, and yet the bactericidal powers remained. These powers were soon destroyed by heat. The author would attribute these powers to the presence of alexin, probably derived from the leucocytes. He looks upon the blood as the great antiseptic and disinfectant of the body, and draws attention to the importance of its investigation in diseased conditions.—*British Medical Journal.*

BLINDNESS IN HORSES PRODUCED BY EATING THE TOBACCO PLANT.

The Australian correspondent of the *Lancet* states that in certain districts of New South Wales, a large percentage of horses become affected with blindness, and a series of interesting investigations into its nature and cause are being conducted at the Melbourne Veterinary College. The various plants growing in the affected districts were very carefully examined, and among them was the native tobacco (*Nicotia suavioleus*). When this was given to horses, toxic symptoms were produced, with, after a time, failure of sight. The results of clinical investigation and *post-mortem* examination point very strongly to the conclusion that the affection is a tobacco amblyopia or retro-bulbar neuritis, similar in all respects to the same affection in man produced by smoking to excess.

THE METHOD OF DESTROYING THE CARCASES OF DISEASED ANIMALS AT HAMBURG.

Persons interested in the management of slaughter-houses know that the disposal of the carcases of condemned animals is a matter of great difficulty. There is always the fear that some of the unwholesome meat may be stolen and sold; and, in any case, the carcases themselves are cumbersome, rapidly decompose, and give rise to serious nuisance. At Hamburg, however, there

is a destructor now in use which rapidly converts the carcases into valuable manure and this without occasioning any inconvenience. I am indebted to Police-Commissioner Früchtnicht for my knowledge of this important invention. With great courtesy the Police-Commissioner conducted me to the destructor works, situated some distance ontside Hamburg, aud gave me all the necessary explanations. The machine consists of a large iron cylinder or drum. It is placed horizontally and a small two-horse-power engine makes the cylinder revolve, The cylinder is approached from above and there is an opening in the side through which the matter to be destroyed is introduced. When full the opening is closed tightly by bolt and nuts. In the centre of this plate opening there is a much smaller aperture, which is also firmly secured, but which can be opened so as to extract samples from time to time and thus determine whether the process is completed. All round the cylinder there is a steam jacket. A pressure of steam is produced equal to two or three atmospheres, though the cylinder has been tested for a pressure of six atmospheres. By plates obliquely placed within the cylinder the mass inside, as the destructor revolves, is thrown towards the centre. This facilitates the mixing during the operation and afterwards the emptying. These plates act as a funnel towards the aperture in voiding the apparatus, the material falling out on the floor below the cylinder by the same opening which, when turned uppermost, serves for loading. The working capacity of the cylinder, which is the largest actually in use, is made for the treatment of about three tons of matter at each operation. At both extremities of the cylinder there are tubes which serve as inlet and outlet for steam, &c. Once the cylinder is filled with the carcases, &c., that have to be destroyed the material is first subjected for two and a-half hours to the direct action of steam under pressure. Then the steam is closed off and only admitted into the steam jacket. The cylinder is made to revolve for five minutes after a pause of half-an-hour's duration, and this is repeated three or four times. When the fat has been fully dissolved and detached from the meat it is drawn out in a very simple but ingenious manner. Through one of the pipes water is introduced into the cylinder, and as it fills the lower portion the fat, in a heated and fluid state rises to the top of the cylinder. Here the exit pipe, which is bent so as to act as a syphon, draws the fats off into an adjoining vat, where they are subjected to a process of clearing. This is achieved by means of a cold water douche, but this section of the work is not as yet fully organised and will be perfected shortly. The amount of fats obtained varies according to the material treated, and the proportion of fat drawn off is equal to from 83 to 90 per cent. of the whole. The water which has served to expel the fat from the cylinder is now got rid of by evaporation. For this purpose steam is admitted only into the surrounding steam jacket. This, the drying process, lasts from seven and a-half to fourteen hours, according to the material treated. The odorous gases generated in the cylinder pass out by the syphon tube and go through a metallic spiral, where they are cooled and the water they contain condensed, the rest passing into the chimney. It is proposed to use this distilled water for the boilers. The material, when the process is completed, comes out as a dry brown powder. It is thrown on to a sieve and any large particles remaining, such as bits of bone, are returned to the destructor and go through the process a second time. On the day of my visit three tons of condemned anchovies were being thus converted into manure. A few days previously twenty-three pigs had been destroyed in one single operation. Owing, however, to the large amount of fat in pigs and varying component parts of different animals it has been found expedient whenever possible to mix the several materials and thus secure a more uniform manure.

Formerly the destruction of condemned carcases cost the city of Hamburg a considerable sum of money. With the aid of the destructor just described

this loss has been converted into a profit amounting in one year to 10,000 marks, from which, however, must be deducted the salary of the superintendent and the cost of the buildings. The destructor is known as the Podewils patent, and is manufactured by L. A. Riedinger at Augsburg. The manure sells in the market for from twelve to thirteen marks the hundred kilogrammes and the fat for from forty to forty-three marks the kilogramme. The latter is used for the manufacture of the better qualities of soap. The dried manure produced by the destruction of the carcases contains from 5·6 to 7·2 per cent. of nitrogen and from 5·7 to 0·8 per cent. of phosphoric acid. On one occasion the proportion of phosphoric acid was as much as 12·9 per cent., but this was due to the destruction of a large quantity of salted pork that had arrived from America. It should also be noted that the property in the neighbourhood of the destructor has greatly improved, as all bad odours have been practically eliminated. The town is now constructing special carts made of iron, which can be securely locked, to bring carcases from the slaughter-house or from the town to the destructor. As a rule, free incisions are made in condemned meat and it is sprinkled with petroleum. Being very volatile, the petroleum renders the meat uneatable. It is proposed now, however, to use crude carbolic acid. The fæcal matter from the intestines of the horses, cows, &c., is gathered and dried in a room where the walls and floor are carefully cemented, and, when dry, it is used as manure. By the side of the destructor there is a shed where the larger animals are cut up into pieces small enough to pass through the aperture of the cylinder. Two more cylinders have been ordered of a larger size and with apertures large enough to admit a quarter of an ox without cutting it up. There is also to be a special apparatus, a digester, for the destruction of animals that have died from anthrax. These will be destroyed without being cut to pieces or touched. Then there is also a project for so laying the floor of the knacker's shed that all the blood and refuse may be drained and sucked up and delivered directly inside the cylinder of the destructor. It only remains to add that the *poudrette* manure produced is altogether devoid of unpleasant odour and is of undoubted commercial value. The odour at the destructor works is somewhat similar to that of heating glue, but a few yards outside the building it can scarcely be noticed. Taking all these results into consideration the town of Hamburg deserves considerable praise for being in the vanguard among the towns of Europe in respect to this important detail of municipal administration. Nowhere have I seen the difficult question of dealing with the carcases of diseased animals and with condemned fish and meat more satisfactorily solved.—*The Lancet.*

THE IMPORTATION OF CANADIAN CATTLE.

A PARLIAMENTARY paper has just been issued containing further papers and correspondence relating to the landing in Great Britain from Canada of cattle affected with contagious pleuro-pneumonia, together with a copy of a minute of the Board of Agriculture, dated August 13th, and minutes of evidence and appendices. The following are the conclusions at which the Board of Agriculture have arrived upon a review of the facts laid before them :—

It appears to the Board, upon a review of the evidence above summarised, that the result of their inquiry has been to confirm and support the diagnosis made by their professional officers to a degree even beyond that which might have been expected. The position of those officers differs very materially from that of the non-official witnesses who were good enough to give evidence before the Board, by reason of the fact that the former are compelled to come to a distinct and definite conclusion in every case submitted to them, and upon that conclusion the administrative action of the Board must necessarily depend. It is, therefore, in the highest degree satisfactory to the Board to

find that so much evidence corroborative of the verdict of their officers has been forthcoming from gentlemen occupying, it is true, a much less onerous and responsible position than the veterinary officers of the Board, but who were nevertheless well qualified to form a judgment on the question at issue. In no single instance did any of the witnesses examined find themselves in a position to assert, without qualification, that either the Toronto or the Mongolian case was not one of contagious pleuro-pneumonia, whilst, on the other hand, the verdict of the professional officers of the Board was absolutely and unreservedly confirmed in many instances.

Turning to the various points presented in the evidence summarised in this minute, it appears to the Board that the very close correspondence, amounting to practical identity, between the appearances present in the Toronto and Mongolian cases and those described in the text-books, or met with in the experience of many of the witnesses, is clearly established. Dr. Woodhead, Professor Macqueen, and Mr. Hunting were of opinion that diagnosis based only upon an examination of the *post-mortem* appearances of the lungs presented considerable difficulty, but even if this be the case, it is clear that the difficulty diminishes in proportion to the special skill and experience of those by whom the diagnosis is made, and the evidence given by Professor Brown as to the work of himself and his colleagues in connection with the lung diseases of cattle, and as to the actual results of their decisions in the 3,133 sets of suspicious cases they have examined since the passing of the Contagious Diseases (Animals) (Pleuro-Pneumonia) Act of 1890, gives the greatest possible weight to any verdict which they may pronounce.

The suggestion that the diagnosis of pleuro-pneumonia by the *post-mortem* examination of the lungs is a matter of difficulty must, moreover, be more or less valid in proportion as the appearances presented in cases of that disease approximate to those manifested in other known lung disorders of cattle. In this connection, the septic pneumonia of calves reported by Dr. Poels, and the results of drenching—disorders due to artificial or accidental causes—were cited, and may safely be set aside as inapplicable to the cases under consideration, and the possibility of confusion as between tuberculosis and pleuro-pneumonia, although apparently not infrequent on the part of persons not well skilled in lung diseases of cattle, may also be disregarded when diagnosis is made by experts in those diseases, the theory that the Toronto and Mongolian cases were cases of tuberculosis not being even propounded by any of the witnesses examined.

The doubts expressed by those gentlemen who feel themselves unable to express unqualified concurrence in the views of the Board's veterinary officers appear, therefore, to depend either upon the feeling that it is difficult to distinguish the *post-mortem* appearances of ordinary catarrhal or broncho-pneumonia from those of early cases of contagious pleuro-pneumonia, or else upon the possibility of the disease with which the Canadian animals were affected being a distinct disorder with the nature and properties of which veterinarians are as yet unfamiliar.

It appears to the Board that the evidence before them is sufficient to negative the suggestion that the Toronto and Mongolian cases were cases of either catarrhal or croupous pneumonia. The veterinary officers of the Board have an extended knowledge of those two diseases; they expressed no doubt whatever as to their ability to distinguish between them and pleuro-pneumonia, even in its early stages, and they explained in detail the *differentia*, both verbally and by the production to the Board or specimens, in a manner which strengthens the confidence felt by the Board in the accuracy of their diagnosis.

It is not unnatural that some of the witnesses examined should safeguard themselves by a reservation as to the possibility of the disease present in the Toronto and Mongolian cases being some distinct lung disorder not hitherto

observed or distinguished by veterinary pathologists. Professor McFadyean, to whose opinion great weight must attach by reason of his personal qualifications and high official position in his profession, was one of the witnesses who referred to this possibility, but it is to be noted that Professor McFadyean wished thus to safeguard himself solely on the ground that "we do not know the organism of pleuro-pneumonia, and, therefore, have not an absolute mark for the recognition of that disease," and not on account of anything of a special character in the appearances of the two Canadian lungs. "I have never seen," Professor McFadyean said, "such lesions as were present in these lungs in British cattle except in pleuro-pneumonia."

In this respect Professor McFadyean differed from Professor Macqueen and Mr. Hunting, who supported the theory of the presence of "a new disease in Canada" by the differentiation of the Toronto and Mongolian cases from the cases of pleuro-pneumonia described in the text-books and met with in their experience. But the evidence above summarised appears to the Board to show that this latter view was due either to inadequate observation of the Canadian cases or to insufficient experience of cases of undoubted pleuro-pneumonia. The veterinary officers of the Board were emphatic in the statement that in no single particular did the diseased specimens present appearances which they have not met in cases of pleuro-pneumonia occurring in British animals, and the detailed examination of those officers respecting the various features to which the attention of the Board was directed by Professor Macqueen and Mr. Hunting appeared to the Board to leave no room for doubt on this point.

The evidence received by the Board seems to them, therefore, clearly to establish—(1) that there is a close resemblance, amounting to practical identity, between the *post-mortem* appearances of the Toronto and Mongolian specimens and those presented in cases of pleuro-pneumonia; (2) that the approximation of the appearances in those specimens to those presented in the case of pleuro-pneumonia is very much greater than in the case of any of the known diseases affecting the lungs of cattle; and (3) that none of the appearances recorded in the Canadian cases can be regarded as foreign to pleuro-pneumonia, or as indicative or suggestive of some other disease hitherto unobserved.

It follows that the Board feel themselves unable to accept the suggestion that, in pronouncing the cases in question to be cases of pleuro-pneumonia, errors in diagnosis were made by their veterinary officers. On the contrary, the Board consider that those officers would have failed in their public duty if, on the information in their possession, they had negatived the existence of pleuro-pneumonia in the cases submitted to them, and the evidence received by the Board shows that their verdict is endorsed by members of the veterinary profession who have had special opportunities of studying the disease.

In the institution of the inquiry the Board were animated by a two-fold desire. In the first place, doubts had been freely and publicly expressed as to the accuracy of the diagnosis of the Board's professional officers, and the Board were anxious to acquaint themselves with the grounds upon which those doubts had been based. In the second place, the Board desired, in the event of that diagnosis being confirmed and supported, as it has been by unofficial professional opinion, to place Canadian veterinarians in possession of a complete statement of the views of experts in this country, since it is with the members of the veterinary profession in the Dominion that, in the opinion of the Board, the next step rests. It is beyond question that a disease occurs in the lungs of Canadian cattle imported into this country which, in the opinion of many of the most experienced and best qualified veterinarians in this country, is contagious pleuro-pneumonia, which, even in the opinion of pathologists ready to admit the hypothesis that the disease is new and

hitherto unobserved, is a bacterial or germ disease, and which could not have developed to the extent shown on the slaughter of the diseased animals in this country a fortnight or three weeks after shipment, unless it had been originally contracted before leaving Canada. In the view of the Board, these matters deserve and will doubtless receive the serious attention of the Canadian Government, and of public and private veterinarians in the Dominion, but in the meantime the duty of the Board is clear. They have no alternative but to act on the assumption that the disease found in the Canadian animals was in fact contagious pleuro-pneumonia, and in view of this fact they must maintain in force the normal security provided by the statute against the introduction of disease by means of imported animals—viz., by their slaughter at the first port of landing.

Army Veterinary Department.

Gazette, August 7th.

VETERINARY-LIEUTENANT C. E. NUTHALL, to be Veterinary-Captain.

Gazette, August 21st.

Veterinary-Lieutenant-Colonel A. E. Queripel is seconded whilst holding the appointment of Inspector-General of the Civil Veterinary Department in India. Veterinary-Major A. A. Oliver, to be Veterinary Lieutenant-Colonel, vice A. E. Queripel. E. J. Barry, gent., to be Veterinary-Lieutenant in succession to Veterinary-Lieutenant-Colonel A. E. Queripel.

The University of Edinburgh has conferred the degree of Doctor of Medicine (M.D.), on Veterinary-Lieutenant A. J. Haslam, M.B.

Parliamentary Intelligence.

HOUSE OF COMMONS, August 6th.

CONTAGIOUS DISEASES AMONG ANIMALS.

Sir R. TEMPLE asked the President of the Board of Agriculture whether the Board, in order to trace to its primary source certain contagious diseases among animals, had for this purpose appointed 31 travelling inspectors, one, the chief, with a salary of £900 per annum, and 30 others at £250 a year; whether these gentlemen possess the scientific knowledge rendering them capable of satisfactorily performing such duties; and whether the travelling inspector has supplanted the veterinary inspector, the person who should be called upon to perform such services.

Mr. GARDNER: The duties assigned to the principal of the animals division of my department and to the temporary assistant inspectors appointed for swine-fever business, who are the officers to whom I understand the hon. baronet to refer, do not require for their performance the possession of veterinary or scientific knowledge. On the retirement at the end of last year of the former director of the Veterinary Department a re-arrangement of duties was sanctioned, and my veterinary officers are now exclusively engaged on work of a professional character; but no work requiring the possession of veterinary knowledge has been transferred to an officer not possessing such knowledge.

August 9th.

CANADIAN CATTLE.

In reply to Mr. CHAPLIN,

Mr. GARDNER said: The inquiry to which my right hon. friend refers did

not take the form of an inquiry by a Special Commission, and consequently there will be no report in the ordinary acceptation of the term. I propose, however, to lay on the table, as I have already stated, a reasoned minute analysing the evidence which I have received and setting forth the conclusions at which I have arrived. The *viva-voce* examination of witnesses was concluded on the 10th ult., but since that date it has been necessary to scrutinise very carefully the various references cited by some of the experts examined, and the subject is so full of technical and scientific detail that some delay in the presentation of the further papers promised has been unavoidable, but I hope that it may not be long before they are available. The Bill to which my right hon. friend refers is a Consolidation Bill pure and simple, and has been critically examined from that point of view by the Joint Committee of the two Houses. It does not appear to me that the papers promised as to the Canadian question would be of any assistance to the House in determining whether or not the business of consolidation has been accurately performed, and I should hope that the right hon. gentleman would, as in other cases, be willing to accept the assurance of the Joint Committee on that point.

August 14th.

DISEASES OF ANIMALS BILL.

Mr. GARDNER moved the third reading of the Diseases of Animals Bill.

Mr. CHAPLIN moved to recommit the Bill in respect of clauses 24 and 25 with the object of inserting amendments making it obligatory on the Board of Agriculture to order the slaughter at the port of landing of all animals coming from foreign countries. The amendments would not alter the law in any respect, for at present it was the law that cattle should be slaughtered at the port of landing, but a discretion was left to the Board of Agriculture. He wished to make the slaughter obligatory, his object being to prevent any possible danger of disease being communicated to cattle in this country.

The CHANCELLOR OF THE EXCHEQUER said that this was the first time in his experience that such a proposal had been made, and he certainly could not accede to it. The object of the Bill was to assist the agricultural interests throughout the country, and if the right hon. gentleman would not withdraw his opposition they would be obliged to discharge the order for the third reading and withdraw the Bill.

Mr. GARDNER: I beg to move that the order be discharged and the Bill withdrawn.

Mr. SEXTON said that a great deal of time had been bestowed over the Bill, which was undoubtedly a very useful measure, and he hoped that the right hon. gentleman would not press his motion as, if so, the Bill must be lost.

Mr. WARNER said he was of the same opinion, and he trusted that the right hon. gentleman would reconsider the case, as the course he had chosen to take was nothing more than that of cutting his own nose to spite his face. He suggested that the motion for the third reading of the Bill should be allowed to stand over for that evening at any rate.

Mr. GARDNER said he had no opposition to offer to that proposal, and suggested that the matter should stand over until Thursday, in order to give the right hon. gentleman a *locus penitentiæ*.

Mr. CHAPLIN: I do not know what the right hon. gentleman means by offering me a *locus penitentiæ*. I cannot draw back from the position I have been forced to adopt in this matter.

The order for the third reading of the Bill was then discharged and the Bill withdrawn.

Jurisprudence.

THE VETERINARY SURGEONS' ACT.

At the South-west London Police Court on August 9th, Mr. M. Musgrave, of 17, Grand-parade, Upper Richmond-road, Putney, was summoned by the Royal College of Veterinary Surgeons for acting as a veterinary surgeon when not properly qualified.

Mr. George Thatcher, who prosecuted, said the defendant had on his windows the following words: "Dogs boarded. All diseases skilfully treated." He proceeded to argue that these words came within the meaning of the section of the Act, which dealt with the official qualification of veterinary surgeons, and made it punishable for any man to adopt the title or description without a diploma.

Mr. Arthur Norman, for the defendant, contended with confidence that the magistrate would decide in his favour. For twenty years the defendant had made the study of dogs a speciality, and therefore there was no question of his skill.

Mr. Denman, in finding for the defendant, said the object of the Act was to enable persons to ascertain who was properly qualified. He dismissed the summons, with a guinea costs, holding that the defendant's description was not a "special qualification."

Proceedings of the Royal College of Veterinary Surgeons and Veterinary Medical Societies, etc.

ROYAL COLLEGE OF VETERINARY SURGEONS.

A meeting of the Council was held on July 4th, the chief business of which was to elect a President for the ensuing year. Two members of Council were proposed—Messrs. I. F. Simpson and W. Hunting; the result of the ballot was the election of the latter by the narrow majority of one, eleven votes being to him, and ten to Mr. Simpson. More than one-third of the members were absent, and it is probable that had there been a larger attendance Mr. Simpson would have been the President for 1894-95.

Two members were elected to represent the veterinary profession at the International Congress of Hygiene and Demography at Budapest, which meets to-day; but as neither of them, so far as we know, is acquainted with a foreign language, the selection cannot be considered a judicious one, in view of the fact that German and French will be the languages chiefly spoken in discussing the various subjects, and that at least some knowledge of the latter is expected in delegates.

LINCOLNSHIRE VETERINARY MEDICAL ASSOCIATION.

A meeting of the Association was held at the Angel Hotel, Peterboro', on July 4th, 1894. The President, H. J. Goodall, Esq., Melton Mowbray, took the chair. There were also present:—Messrs. Dickinson, Boston; Freer, Uppingham; F. L. Gooch, Stamford; J. W. Gresswell, Peterboro'; J. Mackinder, Peterboro'; T. A. Rudkin and Capt. Russell, Grantham; James Smith, Huntingdon; W. P. Weston, Oakham; H. Howse, Lincoln; J. A. Robinson, Hon. Sec., Market Deeping. Visitors: Col. Powell, Melton Mowbray; Dr. Benson, Market Deeping; Messrs. G. and J. Hunting, Peterboro'.

Apologies for non-attendance were received from Dr. Fleming, Professors Williams, Walley, Penberthy, Pritchard, and W. Owen Williams, Messrs. Greaves, Hartley, and T. E. Smith.

The SECRETARY said he had received a letter from Mr. W. Hunting in which he deeply regretted his inability to be present owing to an important Council meeting being fixed for that date, also a letter from Mr. Wragg, in which he thanked the Society for the honour they had conferred on him by electing him an Honorary Associate of the Society, and regretting that he was unable to personally thank them as he was compelled to attend the Council meeting.

A letter was read from the Secretary of the Eastern Counties Society, enclosing a resolution and asking the members to express an opinion that the fees paid to veterinary surgeons for examining horses for insurance companies were too low. A short discussion ensued, and as the general opinion seemed to be that nothing practical would come of the matter, as men would always be found to examine at existing fees, the letter was ordered to lie on the table.

Mr. GOODALL then delivered his presidential address.

He said: According to custom I suppose I must now occupy a little of your time in giving you what we in this Association expect—a short presidential address. Fortunately we have not any burning questions that would be likely to evoke great differences of thought, and considering the too short time at our disposal this afternoon for the important discussion which is coming on, I will not detain you many minutes.

I must confess to mingled feelings of surprise and gratification when I first realised the honourable position in which it has been your will to place me, and now that I am called upon to discharge the functions which devolve upon me, and which I think ought to have been discharged by a senior and more venerable man, I assume that in your judgment I may be attaining to that honourable degree. I have too keen a sense of the responsibilities of the office ever to have coveted the honour, nevertheless I thank you most sincerely for the great kindness you have shown me. It would be the sheerest affectation to pretend I am not deeply gratified, for any man must be proud to preside over meetings such as we have in the L.V.M.A. where not only all the working staff but every member of the Association are a real hard-working, jolly lot, all doing their utmost to help forward the interests of the profession and this Association in particular. I feel quite certain the same help and hearty co-operation which you have given to my predecessors will be accorded to me, and that my term of office will be one of great pleasure.

I think it was Lecky who specially commended the attention of students to the history of institutions in the constantly fluctuating conditions of human life. He said:—"No institution had ever remained for a long period unaltered, sometimes we changed beliefs, changed conditions. Laws of original utility had become simply useless, obstructive, and corrupt; and though by mere passive resistance they might continue to exist long after they had ceased to serve any good purpose, they would at last be undermined by their own abuses. Other institutions, on the other hand, shewed the true characteristics of vitality—the power of adapting themselves to changed conditions and new utilities. Few things in history were more interesting and instructive than a careful study of these transformations, and there was probably no better test of the growth of any institution than the power which it possessed of adapting old usages to new wants."

I have been thinking over the transformations and changes that have taken place in our profession since I obtained my diploma 32 years ago, and with your permission we will take a bird's eye view of the matter, and see if we as a profession show real healthy growth. Please remember the R.C.V.S. has only just completed its Jubilee, so that we are comparatively a very young profession, and have just reasons to congratulate ourselves upon the position we hold to-day.

Look at our Schools; they have all grown, whilst the one in Camden Town, in which I am most deeply concerned, has altered to such an extent that no one once inside the building would recognize it as it stood 35 years ago. The student of the present day is surrounded with advantages which were then unknown. Then four professors and an anatomical demonstrator constituted the staff of teachers, and who can deny that they did not in their day and generation do noble work, especially when we consider the limited time they had to instil knowledge into their pupils, yet did they not lay the foundation sure and firm upon which we are now building a grand institution, whose functions are becoming more and more recognised by the state and the whole animal-loving community. Here we show gigantic growth. What five teachers accomplished in two years, namely, enabled the pupil to obtain his diploma, now requires four years with a staff of twelve teachers. This at first sight looks an anomaly, but let us look at what is required of the student, certainly very much more than could be taught in the old time, and only in keeping with the great educational advancement amongst all classes throughout the country. Then, a pupil paid his fee, and was admitted a student. Now, before he can enter the college as a student, he must give ample proof of his educational attainments. This puts a trained mind in the power of the educational staff, and with such an increase in the number of teachers it naturally follows that more time must be required to impart such a variety of knowledge as is now imperatively necessary if we are to keep pace with the national education. Then, Botany was not an essential, and was studied by a few rather as a recreation. Hygiene is now a most essential part of a student's work and a word constantly upon the lips of every student: then, we scarcely ever heard the word. Bacteriology was in embryo, "without form and void," in fact, I never heard the term during my years at College. Yet this one subject has become a science in itself interesting and instructive to the chemist, botanist, biologist, physiologist, and pathologist. Of course, in a short address like this I can only make a passing comment to show the great activity that has prevailed in this one now most important branch of scientific research, and to mark our appreciation of the great *life* work of Pasteur, acknowledged to be the father of bacteriology, Koch, Lister, Metchnikoff, and a noble array of others who are actively following up this work. I may remind you that Pasteur's theory of producing preventive vaccines against infectious diseases by the alteration of specific virus is now becoming recognised by all students of preventive medicine, and the student of to-day is being taught aids to diagnosis, if not to curative treatment, by the use of animalv accines. How far these will enter into the therapeutics of the future is quite beyond our imagination, neither can we conceive the great progress this one science has wrought in the practice of medicine and surgery, for all who are interested in these must be conversant with the general principles of bacteriology. It cannot be expected that a busy country practitioner can go thoroughly into the working details of preparing the different media for cultivation, and watching the growth of various colonies of specific microbes, but we can read the results of others' labours and apply the deductions which they have made to our every day practice, and then we shall be co-workers for one common end—the alleviation of pain or suffering and the mitigation of disease. To those who are not members of the National Association, I would commend the carefully-prepared paper brought before that association by Mr. J. A. W. Dollar and the discussion which followed; which clearly show that the veterinarian is adapting these new usages to old wants. I sometimes think there is just a tendency to take our young members a little too exclusively on this science—the dessert and confection one. I mean they are taught to know more about the use of the microscope, the biology of microbes and the chemistry of their products than of the occupants of the stable, cowshed and pasture in

health and disease; yet it is through professing to have a special knowledge of these latter that they hope to obtain a respectable livelihood and to command a social status. Microbes, although new to us, are not new creations. They have been in existence as long as disease has wrought pain and sickness, and have only been discovered through the mechanical aids which the ingenuity of man has devised for his assistance, and in nothing is the old adage more true, "What's new isn't true, what's true isn't new," or in the words of a very old book, "That which hath been is now, and that which is to be hath already been."

Thirty years ago the "Fellowship" degree was not known, and when the student had obtained his diploma that was not only his qualification to practise the art and science of veterinary surgery and medicine, but a stepping stone (without paying any more fees, and undergoing any other examination) to all the privileges of the profession, both on the Board of Examiners and in the Council chamber. But the over grasping anxiety of the embryo Fellow in claiming the exclusive right to these honours made the degree oppressive and abortive. I am pleased to see the R.C.V.S. has at last made this a degree which our young members of the profession may be proud of, and it will be an inducement for healthy hard work for a few years after they have obtained their diploma. I think here we may say—if we do not show energetic growth we show vital germination.

Perhaps never in the history of the profession were its services more maligned by the ignorant, or sought after by the better class breeders and feeders than during the years 1865–66, when rinderpest or cattle plague made such havoc amongst our herds. Here, in passing, permit me to remind you of the great difference between our patients and those of the sister profession. Our patients all have a monetary value, and unless we can restore them to health in a reasonable time, so as to make them repay their owners for the extra cost incurred by our expenses, etc., we are not doing the owners any good, although we may have made a very good recovery of the patient. The human practitioner not only uses all the means at his disposal for the alleviation of pain and suffering, but *prolongs* the life as far as possible which is beyond any monetary value. Hence, with lower animals, the stamping-out process was resorted to to save the greater number, with the result that rinderpest soon disappeared. I can remember when pleuro-pneumonia could be found in any practice; and what was the usual advice given to the owner? Why, "Clear out, sell all you have." And this was the best policy as far as the owner was concerned; but what was the consequence? Why, the animals which had been in contact (though not at the time showing symptoms of the disease) were taken to a far-off fair or market and sold, perhaps to several different purchasers in divers distant parts of the country, and these in turn became so many centres from which the disease would develop and spread by a repetition of the selling and distributing process. The consequence was the country veterinary surgeon always had cases of pleuro-pneumonia on his books, and it was in those days a fruitful source of income. Now that the veterinary profession has been heard, and our advice acted upon, we cannot find a case of pleuro-pneumonia in Great Britain to-day. You may think this a slight divergence from my original text, but I think it shows professional growth, for it was the advent of rinderpest that brought the veterinary surgeon prominently before the public, and led to his services being requisitioned and acknowledged by the State, whilst to-day veterinary surgeons in most parts of the kingdom hold the office of inspectors to Her Majesty's Privy Council. As a result of these appointments, and the enforced notification of contagious diseases, we cannot find in our island home a single case of rinderpest, pleuro-pneumonia, or foot-and-mouth disease, and when we contemplate the immense annual loss which had been caused by the two latter diseases, we cannot too

fully estimate the benefits conferred upon the general community by the stamping-out Orders.

Sheep scab is not so prevalent as it used to be. Swine fever and glanders remain as two dark spots about which I will not say anything.

With all this growth, what are the prospects and position of the veterinary surgeon to-day? Is his social standing any better than it used to be? Is the tree, with all these extra robust branches, which are becoming yearly more expensive to cultivate, yielding the veterinary surgeon better, or more substantial fruit? Does society still look upon him as a superior groom? This subject has been well handled by our friend, Mr. Hunting, and has been fairly well discussed, and I think there cannot be two opinions upon this point, although we must all be alive to one fact—the country practitioner is sadly handicapped by the agricultural depression. Ordinary farm-stock has depreciated to such an extent that we cannot make the same charges we used to, and we have to work very hard to make a living.

I should now like to draw your attention for a few minutes to another institution which the requirements of recent years have called into existence: I allude to the *National*, not the Manchester, but the National Veterinary Benevolent and Mutual Defence Society. A great number of veterinary surgeons from all parts of the country have become subscribing members, but very few give it the personal support at its meetings which the importance of the society ought to command. This society is open to all and every member of the profession, who, after he has joined, has not only a right to its privileges and protection should he be so unfortunate as to require them, but he has a right to attend the general meeting, where, amongst other business that may be transacted, rules may be revised if thought necessary. If a member is not satisfied with the existing rules and methods, why does he not go and ventilate his ideas at the proper time and place?—not find fault with those who have devoted their influence, time, and money for the weal of the veterinary profession. If the members will not attend the meetings, the executive, though disappointed with the meagre number present to do the business of the society, must take it for granted that absent members *are perfectly satisfied with all that is being done;* but to keep away from the meetings, and find fault and grumble with what has been and continues to be done, is a very equivocal way of expressing our gratitude to those who have not only started the society, but have worked so hard and willingly that they can show a handsome balance in the hands of their bankers. Judging from the dark clouds and annoying legal actions that have been brought against veterinary surgeons after discharging their duties conscientiously, it becomes a matter of duty we owe to ourselves to make provisions against any contingency which may arise in our every-day practice, that would mitigate the worry and anxiety of the individual who may be threatened with a process at law. Through the indefatigable exertions of Messrs. Greaves, P. Taylor, and others, this is the only institution through which we can secure such advantages. Should any member of the Defence Society be threatened with a law-suit, he will find the above-named gentlemen staunch friends, who would not only thoroughly investigate the merits of the case as to whether the applicant could be defended or not, but whose fatherly sympathy would do much to remove the hateful stigma which he felt resting upon him. Therefore, if there are any in this Association who are not members of the National Benevolent and Mutual Defence Society, let them become so at once; and remember, subscriptions are not all it is our privilege to give. It is our duty, when possible, to give our countenance and personal support at the general meeting, so that its national character may become more established.

There is just one other institution I will mention—these Associations. They have in a few years become established institutions all over the country,

and are becoming recognised as a motor force, supplying the strength which gives vital energy to our whole body politic. It is through these Associations that wants make themselves known in the profession, and, through impartial discussion, the best way of supplying those wants. These Associations now govern our Veterinary Parliament or Council; through these the qualifications of aspirants to the honour of sitting upon the Council are thoroughly discussed, and the units of the profession become more conversant, not only with its requirements, but also with the characters of those forming its governing body. Now that the members forming the Council are elected by ballot, every member of the profession has an opportunity of being represented on the governing body by voting for the candidate he considers best fitted to carry out the needs of the profession with becoming dignity and honour. Another great end which these Associations serve is to gather the members of the profession into one great fraternal whole. It is written in a very old book—"as iron sharpeneth iron, so does a man's countenance that of his friend." I think very few of us ever leave these meetings without a feeling of genuine satisfaction that we have profited by an interchange of ideas. How often it happens that we, in the narrowness of our home life, have been adopting a special method in some particular everyday work which we have thought *par excellence*, but when conversing with a brother practitioner we are often astonished to find he has a much more simple, and quite as effective way of doing the same thing. It is in these Associations that our young members gain much useful information, old members establish a friendship which lasts for life, whilst others who from some cause often think they have a grievance against a brother practitioner, when they meet around this board, or the convivial one which follows, frequently find the coolness—or something worse, which has sprung up between them arises from a petty, and often an imaginary, wrong, which when explained enables them to give the good old English grip of friendship, and remain fast and true friends working side by side with every good feeling towards each other, fulfilling the motto of our College—"Vis unita fortior," and thus lifting us as a profession to a higher social platform.

The Clinical Aspect of Fractures—Discussion.

Captain RUSSELL opened the discussion on this subject, which was treated by William Hunting, F.R.C.V.S., in a paper at the last meeting. Captain Russell said he must thank them for having asked him to open the discussion, although at the same time he felt that had they called upon any other member of the Society they would have done quite as well as he could and probably better. Mr. Hunting's paper was not one that required any controversial argument, it was a paper of marked common sense, and showed considerable thought and observation. Mr. Hunting was a gentleman who took a great interest in his profession and made notes as cases occurred. Mr. Hunting referred to the fact that they could receive benefit from the records of others or from records of their own, and to do as they should do they ought to keep records of their cases.

The great difficulty they had to contend with in the case of fractures was to keep the broken ends of bone in apposition, and in no subject was this more difficult to do, than to control the fractures in the horse. In nine out of ten cases if they slung them they did more harm than good. If they gave chloroform in a standing position he thought it did more harm than good. He described a little adventure that happened to him in the matter of administering chloroform to a horse by a new instrument, which was a total failure, although he gave something like twelve ounces. It was such a failure that when they came to operate, the horse soon sent them scattering. The administration by this instrument had no effect on this horse, and he found it

was of no service at all. The first point as to fractures was with reference to the causes, and here again it was impossible to dispute Mr. Hunting's statement that they were due to external violence and concussion, and sometimes to want of animal matter or of earthy matter in the bone. He produced the humerus of a three-year-old Irish colt, which showed a distinct want of animal matter; the bone was wonderfully brittle—almost like lime, and they could break it in their fingers. In another case of a fractured pastern he dissected it with the parts *in situ*, and thus showed the actual effect of fracture from the natural point of view. This was a result of concussion; the horse was turned out in a grass field, was frightened by a dog, and galloping rapidly round the field suddenly threw up its leg and fell down. He diagnosed fracture of the pastern, and being an old horse they had him destroyed. Had it been a valuable mare he should have thought it necessary to bandage it up and try to save it. He found if he could only get cases sent in early enough and wrapped them in plaster of Paris bandages, that they might be cured. He had only known one case in which a horse could do rapid work after fracturing the os suffraginis. They had a horse at Grantham which had fractured that bone and no one would know that the animal had recovered an injury to the foot. The fracture of the os suffraginis always seemed to break the top of the bone into splinters. In cases of fracture they got shivering of the muscles and pain on pressure, and if the animal was working lame they would find excessive pain by the animal getting out of the way or drawing itself back. They had no difficulty in diagnosing fractures in the region of the hip bone or pelvis. He had a horse under treatment for six weeks in slings. He was confident that there was some kind of fracture of some portion of the pelvis. The animal had shied at a dog, slipped, and fallen on the curb of the pavement. There was exceeding lameness and inability to rise—he could get up only with a great deal of assistance, and if he were on the other side he could only sit up like a dog. He had taken him out of the slings only that morning and he thought there was a chance for him. He had no doubt there was a fracture although he could not discover any displacement of part of the pelvis. They had an adhesive plaster very useful for outside application; it did not dry sufficiently stiff for inside bandages, but it would stop on on a starch bandage for six weeks. They wanted something that would set as hard as a brick over a starch or plaster of Paris bandage. On foals or horses he always placed strips of tin with gutta percha or paraffin cardboard. This latter was very useful for setting dogs' legs; if it was coated over with paraffin it was malleable, and they could shape it with the limb, and it became as hard as a board. It was bad practice in his opinion to tie up a horse or a cow with a broken extremity. They would move themselves about better by themselves, and would do better than if tied up to a manger. One reason was that if tied up they fidgeted, and wanted to move about, and put a great deal of pressure on the broken limb. If they allowed them to move about as they pleased they took care of it. He had a case of compound comminuted fracture of the tibia. The bone was sticking through the skin. There was a wound three inches long, and a great deal of muscular injury. He advised his client to have it destroyed, as the case would cause much anxiety. But after he left the man bandaged him up in the most extraordinary manner, and in some way he had saved him. He showed the case to him two months after and it was certainly a recovery; there was an ugly distortion, but the animal was living and grazing. He did not hesitate to say that if they, as professional men, had bound up the leg, the animal would have died from mortification; and if he had lived, they would have been called bad surgeons. He had a very extraordinary case of fracture in the horse some years ago. He was a very fat horse and was standing in a very small standing, and he was found dead. Of course it was said he was

poisoned, but from the pallid condition he thought the animal had bled to death. It appeared that in lying down he had brought his ilium against the standing post, which was of oak, nine inches square, and the superior spinous process of the ilium had broken and pierced an artery in the pelvis and the animal bled to death as he lay. He produced a specimen of a foal's tibia which was fractured by the mare treading on it. He attempted to set it, but had to destroy the animal, for as its hind quarters became heavier it moved the bone at its axis and it crossed its hocks and could not walk. It was interesting to know what nature would have done in the space of five months. He pointed out how smooth the bone was where required to be smooth and rough where smoothness was not necessary. This was a case of a fractured ulna, which was one of those bones like the calcis and patella where they never got a bony union between the fractured portions. He thought it was recorded in the human subject there had been a bony union, but in 99 cases out of 100 in fractures of these bones they must get a fibrous union. They preserved this animal alive for eight weeks to see if they could get this fibrous band well matured. He was once called to a horse which was supposed to have a fractured hip. Its body was bedewed with sweat, it was in a tremendous pucker, and could not move its limb laterally, but dragged it behind it, and it hung suspended. He diagnosed fracture of the hip and recommended it to be destroyed. He felt convinced he could hear crepitation through the gluteal muscle. He killed the horse and cut down into the quarter and there was no fracture at all. He was of opinion that fractures at the base of the skull were very common among young horses, but they did not hear much about them. He had in his possession seven or eight specimens of fractured skull of all ages, foals and old horses. This one was a four-year-old, and when a two-year-old during lunging the colt reared up and fell back, he was noticed to stagger, and was taken away to the stable bleeding from one ear and one nostril. He diagnosed fracture of the base of the skull, it having a dilated pupil with staggering gait, and could not stand. He was very giddy, breathed slowly, and his pulse was hardly perceptible, and when it could be felt it was no more than 24 or 26 to the minute. He placed ice on the back of his head, and had two men to keep him steady. Two days after the colt went on well, but he said to the steward that he would have to kill him as he would either become paralysed or die. They kept him up, and broke him in, but they could not make him go forward; he could of his own free will but would not do so when asked. He found the animal was totally blind of one eye, and had paralysis of the optic nerve. There was an enlargement on the back of his head something like a small poll sire. They turned him out for another year and finally had him slaughtered. Where the fracture took place there was a piece of bone sticking up quite half an inch through the centre of the fracture. There was a certain amount of deposit, more outside than in, and there was this spicula of bone sticking up, the horse having lived three years after the fracture occurred, and then was destroyed. They also had foals dying from other causes which also had fracture of the skull. Nature was wonderfully kind, and it was marvellous how beautifully she repaired the pieces of the skull. In the case under notice the exostosis took place altogether on the outside so as not to interfere with the brain.

He had lately had a good case of fracture of the lower jaw. This horse some weeks ago showed temper when being broken to harness. The harness was undone and cart run away, and no sooner did the horse find himself free than he threw himself on the ground and then rushed against a wall and smashed his lower maxilla. Three teeth were hanging down and the bone was in two pieces, and the other side split right through. One could have wrung the whole mouth off. They made a lateral incision and with soda

water wire drew the teeth together ; with ordinary suture wire they bound all round the edges of the teeth and held the parts in position, and took out the centre incisor with a large piece of the bone. They kept him on cut food and suction, and he had made a splendid recovery, and they would only notice that the centre incisor was gone. The next tooth would have to be removed, but the bone had united splendidly ; the wires were removed last week, and the horse was breaking quietly. He showed a star fracture on the scapula, which was done by a kick. It was broken right into the joint, but the joint showed no signs of disease. After keeping it five or six weeks it had to be destroyed. He had an interesting case of false union of radius of a dog. It was a very valuable fox terrier and had its radius smashed into 20 or 30 pieces, there being a compound fracture. When brought to them it was very nearly in a state of mortification ; it was very troublesome and kept getting the bandages off. In the result, in two months the dog quite recovered, but it had a false joint. He described the process of bandaging in this case and said that only a professional man could tell that the bone had been fractured.

He believed there were many cases of fractured extremity of a horse which if properly looked after would make quite a useful recovery, particularly in mares. A man had a mare kicked during the night and the off hind leg was broken just above the fetlock. She foaled during the night, and the foal was standing beside her, and she was standing with a swinging leg. They set the leg over and over again in iron bands, plaster of Paris, starch, glue, and everything they could imagine, eight or ten times. One day she was found sitting on the manger with both hind legs and propping herself up with her fore feet ; noticing this they got a pole and covered it with sacks, thoroughly padding it with straw, and she sat upon it with comfort ; she sat and rested on that pole 18 hours out of the 24 and she was afterwards turned out. This piece of wood was taken out into the field and she became sound, spending from 4 to 16 hours a day sitting on this piece of wood. She worked and had foals for six years, and was one day found on her back in the dyke dead. He showed a specimen of what Mr. Hunting called a deferred fracture. This horse was kicked on the forearm. If they examined that, they would find two distinct causes. There was no fracture to feel and no man could have taken that as an actual fracture. The fractured dorsal vertebræ produced were parts of the back bone of a hunter. A lady was riding home over a gap and the horse injured itself. It jumped again and got worse ; the lady jumped off and a man jumped on and rode this horse on the road to Grantham, and the horse laid down and never got up again. The fracture did not seem to go through the canal, but the injury was sufficient to rupture a blood vessel and cause the clot to press upon the spinal column, and so caused death. Capt. Russell concluded his interesting review of the series of fractures amid applause.

(To be continued.)

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting was held on May 25th. Mr. G. M. Mitchell took the chair in the absence of the President, who was called away to Glasgow on professional duties. The following members were present: Messrs. W. Hunter, J. Gofton, Vet.-Major Durrant, J. B. Nesbit, H. Hunter, J. G. Deans, G. Elphick, A. Chivas, J. W. Rider, A. Hunter, and the Secretary (F. T. Finney).

Messrs. Lanchester, of Bishop Auckland, and Stevens, of Durham, were unanimously elected members of the Association.

Mr. H. HUNTER opened the discussion on Professor W. A. Edgar's paper, and

congratulated the latter on its excellence; it must have taken a great deal of time, trouble, and patience to prepare. He could not exactly agree with all the paper contained; for instance, he neither thought it necessary nor expedient to give anæsthetics in the minor operations—not even in the operations of firing or neurotomy; in fact, would not give it in any operation which was over very quickly, as the operation of chloroforming itself often took considerably more time than the object for which it is used. On the other hand, he thought it very advisable to give it where an operation is of long duration, such as where there is a considerable surface of skin to remove, large tumours, &c. He had an operation to perform himself where he removed a tumour 21lbs. in weight from a horse's side. He concluded by asking the members present to give their opinions as to what were the operations in which it was really necessary to have recourse to anæsthesis.

Mr. GOFTON quite agreed with all Mr. Hunter had said; he was very much interested in the paper, and immensely amused at the enormous amount of quiet sarcasm it contained. As to sore backs in horses, he was quite of opinion that the animal very often evinced greater signs of nervousness than he really suffered pain. Pigeon shooting and rabbit coursing, in his opinion, were really abominable.

Mr. W. HUNTER had great pleasure in testifying to the excellence of the paper, but at the same time would not like the idea of going away to castrate twenty young bulls, and having first to give chloroform to each; for a practical man the idea was monstrous. He related a case of unilateral scrotal hernia, in which he had really had great assistance from the use of chloroform. The only possible objection he had was the considerable waste of time it entailed in the minor operations.

Mr. A. HUNTER would not like to go to a farm and say he was about to give chloroform, as farmers have an idea there is too much danger consequent upon it; and in this he quite agreed with them, for in a good many cases the after effects of chloroform are really more injurious than the result of the chief operation itself. As for firing, he had never come across a single case where he had found it necessary to give chloroform, but in such cases as hernia, eversion of the uterus, etc., it was not only necessary, but very practicable to use it.

Mr. ELPHICK said there always had been, and always would be some for and others against anæsthetics. He himself would not dream of giving it, except in extraordinary cases; in many instances the animal would not have suffered so much but for chloroform. He related a case where he had been sent for to fire a horse and to take chloroform with him. The owner not being there on his arrival, he stated his operation and had nearly finished when the owner arrived, who insisted on his immediately giving chloroform. He did so, and as it took at least a month for the animal to recover from the effects of the chloroform, the owner now vows he will never allow another animal of his to have chloroform administered to it.

The CHAIRMAN regretted the absence of the President and Professor Edgar. He himself thought a subcutaneous injection of morphia in a good many cases was quite as efficacious as chloroform itself. He quite agreed with Mr. Elphick that in many cases it did more harm than good. In conclusion, he had very great pleasure in proposing a hearty vote of thanks to Professor Edgar for his most excellent and instructive paper, and hoped all the members would derive benefit from it. The proposal was seconded by Mr. Elphick, and carried unanimously.

Mr. ELPHICK mentioned a new appliance he had been using for some time to keep colts secure and almost immoveable while cast for castration. It is a simple rope, with a small ring attached at one end, and pulled tightly round the fetlock and above the hock.

Mr. H. THOMPSON, of Aspatria, read a most interesting and instructive paper, illustrated by twenty-one diagrams, on—

"PARTURITION IN THE MARE AND COW."

Before considering the subject of parturition I will briefly refer to a complaint which is very common in Cumberland, known as impervious os uteri. At one time I thought that the lesion was, as the name indicates, obliteration of the os uteri; but recent investigations have led me to think differently. In the virgin heifer, in perfect health, the vagina is very much corrugated immediately anterior to the meatus urinarius. In this complaint the vaginal passage is entirely obliterated by these corrugations. Strange to say, this lesion is always seen in white heifers. I have operated on a large number of cases during the last 35 years, but I have only met one exception—a case in a light roan heifer. The animal rarely shows any symptoms of the complaint until she has had communication with the bull, then the symptoms are developed in a period varying from 12 hours to six weeks, the principal portion of the cases occurring in from 12 to 20 days, when the animal is noticed to erect the tail and strain and press as if about to calve. Any fæces which may be in the rectum are forcibly ejected, and occasionally, in severe cases, the rectum is everted, and bloody mucus is discharged from the vagina.

On visiting the animal and finding the above symptoms, with the history of the case and the colour of the cow, the arm should be washed in soapy water and introduced into the rectum. Immediately the hand is passed through the anus, a tense bladdery body is felt beneath the floor of the rectum, and by passing the hand farther forward, this bladdery extension is found to extend as far forward as the brim of the pelvis and into the abdominal cavity. Being satisfied what is amiss, the hand is withdrawn, the fore finger of the left hand is passed into the vaginal passage, when immediately anterior to the urinary meatus the obstruction is found, and a roughening is felt, left from the penetration of the male in the act of serving.

A trocar and cannula (the latter being 10 inches long and 5-8 of an inch diameter) is passed up along the fore finger of the left hand (the point of the trocar being withdrawn in the cannula) until against the roughening, then the trocar and cannula are forced through the roughening into the vaginal passage. The trocar is then withdrawn and the fluid contents escape, this latter being very much assisted by passing the hand into the rectum. The uterus is then washed out with a gallon and a half of tepid water containing one ounce of tinct. ferri.

I have met with cases—and operated upon them—where the animal had had no connection with the male, one case being that of a white heifer, nine or ten months old. The fluid in these cases is of a dirty, milky whey colour, with a very fœtid smell, while in those having had communication with the bull the fluid is of a dirty brown colour with a "stink" resembling that of a decayed cleansing fluid.

Referring to parturition, diagram No. 2 is the natural presentation seen both in mare, cow and sheep, the nose between the knees, and the fore feet protruding through the vulva. In some cows at their first calving all the pelvic ligaments are well relaxed, yet round the vulva for an inch and a half or so there is a constricted sort of band with little or no relaxation. In these cases the owner or attendants as a rule seize hold of the two fore feet, and pull until the shoulders and head of the fœtus are jammed tight in the passage. The head having receded on account of the tightened vulva the fœtus is generally extracted by main strength, with extensive laceration of the vaginal passage and fatal hæmorrhage. By introducing the hand into the passage and examining the head and surroundings, a strong cord should be passed over the head behind the ears of the calf, bringing the rope along each side of

the calf's face and knotting the ends outside, thus forming a loop. By traction on this cord and manipulation with the other hand, the head is delivered, pulling first one leg and then the other until the fœtus is extracted.

Diagram No. 3 represents a case of dropsy of the abdomen of the fœtus. The presentation is natural and there may be plenty of room, but all the force which the farmer or attendants may use, fails to accomplish delivery. By passing the hand over head, neck and shoulder of the fœtus the cause of the obstruction is found in the distended belly of the calf. Some practitioners use a large trocar, and press this through the breast or side of the ribs of the calf, whichever is easiest of access. For my own part I prefer the ordinary parturition finger knife, pressing this in between two ribs when the fœtus and water come away readily.

No. 4 diagram represents the head being presented with the feet back. In some cases the head may be repelled and the feet got up, more particularly in the mare and ewe, but in the majority of cases it is best to dissect the skin back and remove the head by the atlo-axoid articulation, tying the skin firmly round the end of the bone, leaving the end of the cord outside, then by pressing the neck back into the uterus and getting up the feet, delivery is accomplished.

Number 5 shows a very common presentation in the mare, cow and sheep. In this we have both fore-legs presented, while the head is bent back, the nose forward pointing behind the elbow. This case is generally made more difficult by the attendants seizing the fore-legs and pulling them, without examining the position of the head. The feet should be secured with cords and a hook put into the eye socket or angle of the jaw, or a strong cord put in the mouth securing the under jaw, the fœtus repelled into the uterus and the head manipulated into position. No. 6 is a somewhat similar presentation to the last, but the nose is pointed backwards towards the flank. In No. 7 the fore-legs are presented as in 5 and 6, but the head is thrown backward on the back of the fœtus. The feet in both 6 and 7 must be secured with ropes. A cord put into the mouth, or hook in the eye socket, the body pressed back into the uterus and the head, if possible, brought into position.

These three last cases at times cause a great deal of trouble by the parties tinkering on with them too long before sending for veterinary aid; all the natural waters having been expelled and uterine pains exhausted, while the uterus itself has contracted on the fœtus as tight as a glove on a lady's hand. When this is met with, the best mode of procedure is to make 6 or 8 quarts of linseed jelly; strain it through a cloth, and pump it in the uterus over the body of the fœtus with Reed's patent enema syringe. The linseed jelly not only distends the uterus and floats the fœtus, but acts almost as natural waters. If the head cannot be got into position after this (which is most common in the cow) then the finger knife or the large embryotomy knife must be carried as far up on the shoulder as possible, dividing the skin down the whole length of the limb to the fetlock. A cord should then be fixed round the pastern joint, and while an assistant pulls this steadily outwards the shank is skinned as far up as possible. The skin should be secured by a small cord, then with the fingers detach the skin from the rest of the limb up over the shoulders as far as can be reached. The knife is then again introduced and the pectoral muscles divided. Strong traction is applied to the rope round the fetlock, and the limb generally comes away. The head may then be got into position. If, however, this is not yet possible, the other limb must be removed in like manner. As soon as both legs have been removed the fœtus loses its support, dropping into the bottom of the uterus, when the head can readily be got round by means of hooks and cords. In the mare when both fore-legs are presented and the head thrown back on the quarter—a very common occurrence—the bones of the face of the fœtus are developed to correspond with

the convexity of the quarter. The feet are usually seen outside of the vulva but only the tips of the ears can be reached. In this case no time should be wasted in trying to turn the head around, but proceed at once to remove the fore-legs and turn the head as already described. In the mare I consider this one of the most formidable cases met with.

No. 8 represents the animal on its back with the back of the head presented and the feet back. This case is most readily righted by casting the animal, putting her on her back and elevating the quarters with trusses of straw. By bringing the head of the fœtus round by hooks or cords the feet may be placed in position by the hands or secured with cords.

No. 9 is a breech presentation with the hind legs coming in proper position for delivery, which may be accomplished without any inconvenience to mother or fœtus, but in many cases where the calf is large it dies in the birth.

No. 10 is where the points of the hocks are presented at the brim of the pelvis. Delivery may be accomplished as is shown in plates 11 and 12, by repelling the fœtus into the uterus, and pressing the quarters of the fœtus against the spine of the mother, steadying it there by the repeller, while the other hand manipulates the foot by pressing the toes into the hollow of the heel, bringing the foot round over the brim of the pelvis of the mother and into the passage. Both limbs having been manipulated in this fashion, delivery is accomplished.

In No. 13 the tail and breech are presented and pressed tight on to the brim of the pelvis. In the cow delivery may be managed as in the three preceding cases, but in the mare—if the points of the hocks can't be reached —which is most frequently the case—the only mode of procedure with safety to the mother is to cut through from the stifle joint over the hip joint to the point of the ischium, liberating the head of the femur—not an easy job—to which a cord is attached. This is pulled outwards by an assistant, while the operator with the knife cuts through the muscles on the inside of the thigh. The leg is thus extracted thigh foremost. After this the abdomen must be opened and the fœtus eviscerated. Breaking through the obturator foramen, a stout cord is passed through, and while the operator presses the other hind limb against the walls of the empty abdominal cavity, this cord is steadily and forcibly pulled and delivery takes place. Sometimes, however, both hind legs have to be removed. The dotted lines on plate 13, showing a cord attached to the foot is copied from a plate in Steele's "Diseases of the Ox." I would travel some distance to meet a man with length of arm sufficient to cord a pastern so placed, and even after this cord is fixed, if it were possible, I should like to know how delivery is to be accomplished. I also think that some difficulty would be encountered in trying to pass the hook in between the thighs as shown on the diagram. The representation of the incision and head of the femur is my own.

Nos. 14 and 15 show all four feet presented in the passage with the head turned back on the side or quarter. These cases are of frequent occurrence in the mare, and can be made a very easy operation or a most difficult one, more particularly so if someone has brought the fore-feet outside the passage as far as the knees, while the head is out of reach pressed back into the uterus, as in diagram 7, only making this case more difficult by having the hind feet in the passage over the brim of the pelvis. If called early, or where no interference has taken place, the case may readily be adjusted and delivery be accomplished in a very short time, by attaching strong cords to the pasterns of the hind limbs, and while these are pulled out alternately by assistants the operator presses the fore-feet back into the uterus. The hind quarters come into the passage, and by careful and steady traction delivery is soon over. Where the legs are jammed in the passage, for the safety of the mother, press the hind feet back to the brim of the pelvis, remove the forelegs as

described under diagram 7, then bring the hind feet forward by cords attached, prior to their being repelled, the operator then pressing the breast of the fœtus back into the uterus while assistants pull it away hind legs first.

No. 16 represents a case in which the back of the head and neck presented, the forelegs being back and the pastern joints doubled round the thigh of the hind legs, while the hind legs pressed against the brim of the pelvis of the mother. The fœtus was very rigid, as if all the joints were anchylosed. After many attempts to straighten the head—resulting in failure—it was detached and a strong cord was fixed over the neck close down to the breast; it then could not be stirred. The upper shoulder was next removed with great difficulty, a cord was passed round the humerus, and with strong pulling the leg came away. The sternum was detached on each side and removed, the four anterior ribs were next removed, by passing the knife between each rib up to the vertebra and twisting them off, the contents of the thoracic and abdominal cavities were then torn out; the remaining foreleg and the two hind feet were pressed towards the spine of the fœtus while assistants pulled on the neck cord, and extraction followed. The operation lasted four hours and the mare did well.

No. 17 is a transverse presentation, where the fœtus is lying crosswise in the womb, with the points of the hock presented towards the os uteri, and the quarters pressing to the off side of the mother, with the hind feet pressed firmly against the near side; the root of the tail within reach, but the feet and pastern joints can't be touched. The best mode of procedure is to cut through the tendo achilles above the point of the hock, bring the point of the hock outwards with the hook, put a loop round the front of the hock with a good strong cord; flex the front of the shank bone against the front of the tibia, and pull the hind legs into the passage, when extraction of the fœtus follows.

Nos. 18 and 19 represent twins. In all cases of parturition, before any cords are attached or any pulling attempted, careful and minute exploration and examination must be made—more particularly so in cases of double or triple birth. Make perfectly certain that the legs belong to the head and neck of the fœtus presented.

No. 20 represents a case of monstrosity, in which the hind legs were doubled over the shoulder, and the fore-legs under the chin, while the walls of the abdomen were reflected over the hind legs, and the viscera floating loose in the uterus of the mother. When the bowels are presented first, after careful examination, they must be removed; then divide the vertebra at the most convenient point, and extract the portion readiest to hand by passing in hooks. When the head and feet are presented, the case is more serious. Sometimes one or both fore-legs may be removed, and by attaching a cord to the head, you may be fortunate enough to break the back bone through. After removing the anterior portion, the rest is removed by hooks, while the viscera follow.

No. 21 is a case of torsion of the uterus. Having had several of these cases, I have never yet, except the first case, which was killed, found a complete twist, but only a partial one on the under side of the vagina. The animal may show signs of parturition, paddling with her feet, screwing her quarters, whisking the tail; the pelvic ligaments and vulva relaxed, but yet no pronounced labour pains. On introducing the hand into the passage, about three-quarters of the way up, you find a distinct cordy thickening on the floor of the vagina, running from right to left or *vice versa*, resembling half a screw. After passing the hand over the screw, you come into a cavity before reaching the os uteri. On reaching the womb, the fœtus may be felt. If lying in the position represented in the diagram, the head and feet must be secured with ropes and hooks, and brought gently forward, and jammed as far into the

passage as possible. In some cases the animal drops suddenly on to her side, and thus undoes the partial twist, with ready delivery. In other cases the animal has to be cast on to the side. If the twist is from right to left, cast her on her right side. The animal must then be rolled over to the left, while the operator seizes hold of the fœtus and presses to the right, when the animal is directly on her back, steady traction being put on the cords, the uterus rights itself and delivery is accomplished.

Constriction of the os uteri in the cow is known in Cumberland as "horny lyer." When the pains are very strong, a good dose of opium—two to three drachms suspended in hot water—or from six to eight drachms chloral hydrate should be given, while the os uteri should be smeared with a drachm or two of ext. belladonna; when in the course of 12 to 24 hours the animal may calve all right, but sometimes we come across a sort of cartilaginous ring round the os, through which the hand cannot be passed; this ring having a flange in breadth of $\frac{3}{4}$ to 1 inch, and about $\frac{1}{8}$ to $\frac{1}{4}$ inch thick. This must be cut on the upper portion and also on each side. Smear well with belladonna; give a good sedative—opium or chloral—and *wait patiently*. But sometimes relaxation does not take place; then delivery has to be got at by cording feet and head, bringing them into the passage, and by taking plenty of time and care, delivery may be successfully accomplished.

The Cæsarean section. This operation may be performed on the mare, cow, sheep and pig, where the offspring is alive and of more value than the mother. I have been successful on many occasions in saving the lives of calves, foals, lambs and pigs, but at the sacrifice of the mother.

Retention of the fœtus. This is sometimes seen in cattle. At the end of the period of gestation, the cow shows all the signs of approaching parturition, the udder is distended, teats pointed, etc., but no direct labour pains are evinced. Finally, the ligaments tighten up and the udder scales away; the animal, though feeding, loses flesh. In a few months after, she begins to pass various bones per rectum; or the fœtus may become mummified, and its presence be not indicated until after slaughter. I have met with these cases.

Sheep occasionally in frosty weather have eversion of the upper portion of the vagina with the os constricted, the animal having severe straining. Apply to the parts extract of belladonna and return to position, keeping it there till the os dilates, with stitches across the vulva, and give linseed oil, eight to ten ounces, with four drachms tinct. opii. B.P. If the weather is mild, these cases may do well, but if the frost continues, they generally terminate in inflammation and gangrene.

Inertia of the uterus. I have occasionally come in contact with cases of this, where the uterus and vagina are intensely dilated, the fœtus lying in natural position, yet no attempt to expel it is made by the mother. I have had most success by introducing the hand into the uterus, and seizing hold of the fœtus, drawing it into the passage slowly and gently. Extraction is generally accomplished without any assistance from the mother.

The placenta or afterbirth in the mare ought never to be allowed to remain more than eight to ten hours after birth, more particularly when the mare is on dry food in the stable, as it most frequently brings on septic laminitis. In some seasons I have seen this almost resembling an epidemic, having had into the teens of cases in two months resulting in laminitis. All this may be avoided by timely removal of the membranes, which must be carefully done, as the smallest piece left is quite sufficient to cause a great deal of constitutional disturbance, and in some cases septic poisoning, and death. Cattle, on the other hand, can retain the fœtal membranes for from six to eight days, with little or no constitutional derangement. These cases in cows are much more frequent now than formerly. I have attempted their removal at from six hours after calving until the 8th day. At the 5th and 6th day, they may be

sometimes successfully taken away. I generally inject into the uterus eight or ten quarts of tepid water, containing a small portion of Jeyes' fluid or Sanitas, then by introducing the hand, and by gentle traction and torsion of the membranes, they may be successfully removed. I have great objections to cutting small pieces off the portion of membrane hanging outside, and have further objection to farmers hanging a horse shoe or other weight to it. When the animal is feeding, milking, and chewing her cud, I recommend leaving it alone until the 6th or 7th day in winter, and 5th or 6th in summer, rolling the membranes which are hanging outside into a knot, to be out of the milker's way. After removing the placenta from the mare and cow, I generally inject into the uterus five or six quarts tepid water containing one ounce tinct. ferri. perchlor., which I find to be the best antiseptic.

In all cases of parturition in the mare or cow—more particularly the latter—immediately they show signs of calving, they should be put into a nursery box, and never be allowed to calve in a byre containing other pregnant animals. This latter, I do honestly believe, is one of the causes of abortion.

Putting the cow in a box, and leaving her and the calf for three or four days (milking the udder occasionally by the hand), is also one of the best preventives of milk fever, in my opinion.

There are many accidents the result of parturition, more common in the mare than in the cow, such as the fore-foot of the fœtus being forced through the roof of the vagina, or through the floor of the rectum, and out at the anus, or the anus and vulva—from the same cause—are made into one common opening. Immense sloughing usually takes place in these cases.

Eversion of the uterus. This is not of very frequent occurrence in the mare, but often happens with the cow. In the former, great care ought to be taken immediately the uterus is in sight, if the mare be in a standing position, to keep her on her feet, and a prompt attempt be made to return the organ. If lying down when the uterus is first noticed, she ought to be kept down; legs tied, quarters elevated, and the uterus supported with a large cloth, and return attempted as quickly as possible. In the cow, should the animal be down and the fœtal membranes attached, the uterus with the attachments should be placed in a large vessel containing a quantity of warm water and milk. The uterus should be lifted into the vessel by means of a large cloth. When in the water, the placental membranes should be removed by pressing the cotyledons together, the cow's forelegs being tied to prevent her rising. The hind quarters should be elevated by means of bags of chaff or bundles of straw, then by first pressing back the neck of the uterus and kneading the body in—on the lower side particularly. As soon as the body of the organ is within the pelvic bones, the hand must be placed on the everted end of the horn, and pressed gently forward, thus returning the horn into its proper position. If the point of the horn is not properly returned, the whole uterus is easily everted again. Pressure should never be applied when the animal is straining, always give to her. Cases are frequently met with where the womb has been out for five or six hours. The mucous membrane is very much congested, jelly-like, and very stiff from infiltration of fluid in the submucous tissue. Before attempting reduction in these cases, the uterus should be scarified with a lancet all over, and kneaded with the hands to make it pliable. When the animal is standing, the uterus should be supported by a large cloth held by two attendants, one on each side. Before attempting reduction, trusses of straw or bags full of chaff, hayseeds, or saw-dust should be placed one each side of the hind-legs, and one between, so that if the animal lie down, the quarters will be readily elevated. After reduction, five or six quarts of tepid water containing one ounce tinct. ferri. injected into the womb, acts as a good antiseptic, and causes the uterus to contract, closing up any lacerations which may have been caused in reduction. Stitches may or may

not be put across the vulva, or a truss may be put on to prevent recurrence. Should the animal strain and press a great deal after returning, the best sedative is to drive her into a pond, and let her stand there up to the knees for fifteen or twenty minutes, drinking the water if she is so inclined.

Eversion of the bladder. This is also now and again met with. It is easily known by the bluey-green colour, and the constant dribbling of water down the thighs. By careful examination you find the meatus urinarius, with the portion of the bladder hanging out. By gentle pressure it is readily returned, but is very bad to keep in its place; but by keeping the animal moving about and dashing a few quarts of cold water against the vulva, it retains its position.

In conclusion, I must name another matter, and that is, I strongly recommend the tying of the navel string with some antiseptic cord both in foal and calf. This, I have every reason to believe, is one of the best preventives of those septic diseases known as "joint-fellon" and "navel-ill." I am sorry to say that I differ with my old friend Professor Williams in this matter, but unsanitary surroundings have a deal to answer for in these diseases.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of the Association was held at the Swan Hotel, Stafford, on May 11th. Mr. H. Olver, of Tamworth, president, was in the chair. There were present Professor Penberthy, Messrs. J. Blakeway, Birmingham; Jones, Leicester; H. J. Dawes, hon. sec., West Bromwich; R. Cartwright, Wolverhampton; R. C. Trigger, Newcastle; W. S. Carless, Worcester; W. Carless, F. Carless, Stafford; J. Coe, Stoke; Pemberton, Bridgnorth; J. Burchnall, Loughborough; G. Smith, Tunstall; J. Wartnaby, Burton; A. Over, Rugby; Hodgkins, Hanley. Visitors: A. W. Mason, Leeds; H. Bidlake, Stafford.

Messrs. H. Bidlake, Stafford, and W. H. Brookes, Handsworth, were nominated for election as members of the Association.

The HON. SEC. read the circular letter received from the Central Veterinary Medical Association, referring to the Veterinary Defence Association.

On the proposition of Mr. BLAKEWAY, seconded by Mr. W. S. CARLESS, it was resolved that it was not in the interests of this or any other society to criticise the conduct of another society.

Letters of apology were read from the following:—Professors McFadyean, Walley, Williams, McCall, Pritchard, Macqueen, Sir H. Simpson, Dr. Fleming, Messrs. Malcolm, Goodhall, Wilson, Green, Price, Wragg, Perrins, and others.

The following presidential address was delivered by the PRESIDENT:—

Gentlemen,—In assuming the presidential chair of this Association, allow me first to thank you for the compliment which you have paid me in electing me for a second time to this position. I assure you I appreciate the honour which you have conferred, and nothing shall be wanting on my part, as far as I am able, to make the coming year as successful as any of its predecessors in providing alike interesting papers and securing the comfort of the members, on whose support I confidentially rely. I thus early claim your indulgence—time has not permitted of my writing an inaugural address, as has been the usual custom, and I can offer a few remarks only on what I think may be of interest to you. But, before doing so, I must allude to the sad event which has taken place since we last met. Unhappily, my predecessor, Mr. Merrick, who presided over you on that occasion with his usual ability, has left us for ever. We cannot forget the happy face and ever genial smile of the man who was always willing to spend himself to add to the comfort of others. Nor should we forget that Mr. Merrick was something more than our president:

he was also a member of the Council of the Royal College of Veterinary Surgeons by nomination from this Association, and in each capacity he was an attentive and diligent worker. We very sincerely mourn his loss, and I feel sure it will be your wish, before this meeting terminates, that we should pass a vote of condolence and sympathy with his sorrowing wife and family in the loss they have sustained.

My mind to-day, perhaps naturally, reverts some twenty or more years, and compares the position of the Midland Counties Veterinary Medical Association of that day with the present. Then the Society was in a moribund condition; three meetings were called to discuss the advisability or otherwise of putting an end to its lingering existence. At the first two meetings the necessary quorum of five was not present; on the third occasion we were more successful, and after considerable discussion it was determined to make one more attempt to resuscitate it. Its officers worked steadily and persistently, with the result that the almost defunct Society of twenty years ago now claims to be one of, if not the strongest provincial Association in the country. And I am proud to see this, for I believe nothing in connection with the veterinary profession tends to do so much good to the profession as a body, as well as to the individual members, as do the meetings of these Associations. I take it its objects are mainly threefold, viz., scientific, political, and social. In a scientific sense we who have graduated any number of years know that the teaching of pathological and other subjects of to-day is quite different to our student days. To hold our position as scientific men and successful practitioners we must keep pace with the advance of science, and in addition to our reading, these meetings have vastly assisted to this end, for the leaders of thought and scientific research of the profession, in the persons of the professors of the different schools and others, have from time to time come amongst us and delivered addresses or read papers on subjects of interest, and by explanation and discussion have enabled us to grasp facts which could not have been so fully or agreeably obtained in any other way. To-day we are looking forward to an intellectual treat in the address which will be delivered to us by Professor Penberthy on "Intestinal Parasites."

Politically, we know that in the last few years many and most important changes have been brought about by the governing body of the profession; these matters have received attention at the hands of this Association, and resolutions passed by meetings of members such as these must carry considerable weight, and also strengthen the hands of the Council in their deliberations. But our political strength does not stop here. By the alteration in the method of election, every M.R.C.V.S. has now a vote for members of Council without going to London, and these Associations have rendered good service in nominating from amongst its members gentlemen known to them as being suitable for a seat on the Council Board. By combined efforts our nominees have frequently been returned, and I would remind you that our old and tried councillor, Mr. Trigger, is this time one of those who seeks re-election. We know, and the Council knows, that he is not only one of the most active, but also one of the most independent men on that Board, and I am sure you will agree with me that we must make his re-election, as far as possible, a matter of certainty.

Socially, I believe these meetings do a vast amount of good. Is it not a fact that in the past one of the great drawbacks to professional advancement has been the jealousy that has existed amongst the members? Through the influence of this and similar associations I believe this feeling is being very largely dispelled. We are apt to think ill of a man that we do not know, and of whose doings we probably only hear exaggerated misstatements; but meeting together on such occasions as these, we most frequently learn that the man whom we have grown to dislike without knowing him claims, and rightly

claims, to be as honest and honourable as ourselves; and distrust, through the influence of the social board, gives place to mutual good feeling, and frequently to lasting friendship. If these Associations had no other object, I think their existence would be justified from the point of view that it enables us to know each other. and by friendly intercourse to rub off the rough edges of discussion, and to help to make our motto, *Vis unita fortior*, a truism.

Turn from our own Association to the larger field of the veterinary profession, and again compare our position of twenty years ago and that of to-day, and what do we find? I think we shall admit at once a very marked advance. The period of study at our schools has been increased from two sessions, and our examination to three sessions and three examinations, and this year is added still another session. This admits of the teaching not only more fully the different subjects included in the curriculum, but has enabled that curriculum to be considerably extended, which must be, in the long run, to the advantages of the profession as a body, as well as to the individual members. Another step in the right direction is the raising of the educational standard. It has been my lot as an examiner to have to read certificates, etc., from students which in any particular would not have been a creditable production from a board-school boy of the present day, and I would ask, is it possible that mental faculties which have been so sadly neglected in their early days can fully grasp the many intricate and deeply-worked-out scientific truths such as are required of the student of veterinary medicine and surgery of to-day?

The query is sometimes put—is the position of the veterinary practitioner, and do the average emoluments of the profession justify the expenditure of so much time and money? I would answer, the position of the veterinary practitioner is very much what he chooses to make it. If the fact of his being a veterinary surgeon is not a passport to society, it certainly is not a bar; and it is only by refusing to admit into our ranks uneducated and unfit men that we can hope to fully attain to the position which we claim to be entitled to. We are sometimes told that it is not to be expected that these highly educated men will undertake some of the work which the veterinary surgeon is called on to perform. In reply I would remark that I have yet to learn that education unfits or makes a man disinclined to do any duty which he may be called on to perform. The practitioner of human medicine is not above his work, and I should maintain that nothing we have to do in the practice of our profession is nearly so objectionable as the human surgeon is constantly performing; no stable, cowshed, or other building that we have to enter is half so obnoxious as the wretched hovels called human habitation found in the back streets and alleys of large towns, where the human practitioner, in the midst of squalour, poverty, and disease, is called on to attend the sick and ailing members of the human family. And I think we should not forget that every Englishman is now educated, and I believe as education advances, so will the man having practical knowledge with science be more appreciated; quackery will gradually but surely give place to true knowledge; the public will learn that advice is frequently worth more than drugs; and preventive medicine will be much more sought after than it is to-day.

I think our Council is to be congratulated on a great deal of the work which has been performed in the past few years. Naturally, a certain amount of friction has been the result of sweeping changes, and I think the time has now come when rest is required, so that the many alterations may be settled into working order, and amended in detail if necessary.

With a general approval of the work done by our Council, there is one step which they have taken in conjunction with the Farriers' Company and the Royal Agricultural Society which I take to be very unfortunate. We all wish to see the art of shoeing improved, for we all admit the great amount of

mischief that is brought about by the mutilation of horses' feet; but surely it is not the right way to make such improvement, to give men certificates of efficiency in the art of shoeing without seeing that they are really efficient in every branch, both in making and putting on the shoe, as well as in preparing the foot; and I hope no veterinary surgeon will in future be found to sign the certificates of proficiency without first satisfying himself that the man is really a good workman. No amount of theory will make a man a practical shoeing smith. Then, why call shoeing smiths *farriers*? Well, an old London Company holds the title of farrier, but not one person in a hundred, either in the metropolis or out of it, would connect that term with a shoeing smith. In country districts, undoubtedly, it is still largely applied to the veterinary surgeon, but never to the shoeing smith. The latter is generally not over troubled with modesty as to his qualifications to attend to all and every ailment of the horses' foot or other part of the body, and, I am told, is already flourishing the elaborate diploma of the Farriers' Company as an evidence of his capability to act as a farrier in the general acceptation of that term. I have not myself seen one of these certificates, but I think the sooner the term "farrier" is deleted the better. Only shoeing smith should be used.

The one topic of perhaps most interest to the profession just now is the proposed establishment of a Veterinary College in Ireland. As practitioners it is no part of our province to interfere with the starting of a teaching school in any part of the country, and now as we learn it is proposed to affiliate the College in Dublin to the R.C.V.S. of Great Britian, we might perhaps be satisfied. But £15,000 has been promised by the Government towards this institution; the major part of the money comes out of the pocket of the British taxpayers, and I think we have a right to complain if the money is given to establish a fresh teaching school, unless the present schools have also granted to them some State aid, and this every Government hitherto has declined to do. To persons not "in the know" as to the working of political parties this grant seems an anomaly, especially as the names of Irish veterinary surgeons as supporters of the scheme are conspicuous by their absence. I think our Council should watch very carefully this proposal; and it should not be forgotten that very great changes take place in the opinions of Governments as well as other bodies of men. A few years ago Home Rule for Ireland was declared to be outside the range of practical politics by the very people who are now propounding it as a panacea for the ills of that distressed country, and the then representatives of a section of the people in Parliament—who are still M.P's.—declared that nothing short of separation would satisfy them. Are we quite sure, if the Emerald Isle obtains its own parliament, that they will be satisfied for Britishers to examine their veterinary students? As I before said, I think our Council should very carefully watch and consider this question.

Gentlemen, I will not further occupy your time only to apologise for not having something better to offer you than these few disjointed remarks. I again thank you for the honour you have done me in electing me your president, and now have the pleasure of introducing my friend Prof. Penberthy, who will both interest and instruct you much better than I could hope to do.

Professor PENBERTHY read a paper on—

"REMARKS ON SOME OF THE COMMON PARASITES OF THE STOMACH AND INTESTINES OF DOMESTICATED ANIMALS."

Professor PENBERTHY expressed his pleasure at hearing the President's address, and said that his appearance at the meeting in the position he occupied was in response to an invitation from the President ostensibly to

give them an address on the above subject, but in reality he was more influenced by a desire to repeat an ever agreeable acquaintance with his Fellows of the Midlands than by the idea that he had anything very new to bring under consideration. One result, at least, of being invited pretty frequently to address meetings of Medical Societies, was to be drawn to the conclusion expressed by Solomon, "There is nothing new under the sun." Fashion, however, as well as scientific experiment and careful observation of common facts, supply some basis for variety. Until comparatively recent times the causes of disease generally were deemed too subtle for demonstration. Their corporeal existence was not recognised, they were termed *materies morbi*, humours, and what not; at any rate, they had to be shrouded in mystery and shot at blindfold with a brown Bess, or cut down with a pruning hook, wheat and tares coming down together. For centuries, however, intestinal parasites have been regarded as causes of disease. We find diagrams of ascarides in Solysel, and of tapeworms long before his time. Early in this century Bracy Clark figured the stomach bot. The subject of helminthology in anything like a systematic form, received no attention from veterinarians in this country till taken up by Dr. Spencer Cobbold, to whose memory I should like here to pay a tribute of high esteem for the part he took in drawing attention to these tangible disease producing factors. The vigour with which Dr. Cobbold pursued the subject of helminthology is well known to us all, and I believe we shall all agree that we owe him a deep debt of gratitude.

Happily the study of animal parasites provides us with much knowledge that is applicable to every-day practice. Helminthologists, like bacteriologists, may be very enthusiastic, and sometimes inclined to attribute all diseases of animals to worms. Perhaps we may not all be able to go to the full length with Dr. Cobbold and see, in the *trichina spiralis*, the "fiery serpents" of Scripture, but I venture to think the subject of parasitism is to us of very great importance, and one which will pay for a little more attention than is often accorded to it. I think that we are coming to realise that in disease as elsewhere sequences must have causes. There appears to me a tendency at the present moment to too exclusively seek demonstration of them through the microscope and even in the test tube. I do not intend to imply that because the use of the unaided senses is perhaps neglected, that the artificial aids to diagnosis, etc., are less valuable, but it occurs to me that by fashion one may obscure the other. I am satisfied that anything that tends to lessen the confidence of the ordinary practitioner in making post-mortem examinations must have a deleterious effect on his practice. Most of the parasites of which I propose to speak to-day are visible to the naked eye, and I am disposed to the view that careful post-mortem examination by practitioners would have the effect of demonstrating animal parasites as more common causes of disease than we expect. The value of making post-mortem examinations and reporting the results to Associations of this character I think of great importance, as bringing together the experiences of special districts. "One swallow does not make a summer" and the presence of a parasite may not allow us to say that disease is due to it. In connection with the presence of intestinal parasites it is important to have consideration for their numbers and the condition of the host. It is essential to know some of the fundamental facts of the life history or the habits of worms. A few parasites find a suitable soil in different species, but as a rule one species of parasite infests one species of animal. Again we know that a parasite may pass one phase of its existence in one species of animal and another phase in a different species, and induce disease in each. In some instances, notably the fluke, the disease is best prevented by interrupting the cycle outside the body, in bringing about such conditions as are unfavourable to the existence of the fresh-water snail.

The conditions of which the presence of worms in the alimentary tract depend, are of course affected by circumstances affecting their development outside the body. As a general rule moisture seems to be favourable to their increase, and it is found that parasitic diseases are specially prevalent in damp situations and in wet seasons. The present would appear to be an exception to the rule. Last year was specially dry, and presumably unfavourable to the life of ova, embryos, and worms outside the body, yet I believe this spring helminthiasis has been extremely common. This is to be accounted for probably by the close grazing of last fall and summer, and the consumption, during the winter of close cut forage, mostly gathered from situations normally wet.

As a general rule, disturbances arising from intestinal parasites are much more common in some neighbourhoods than others, and this for the foregoing reasons. but it is important that we should recognise that the ova and embryos of helminths may be introduced into fresh situations, and remain there an abiding source of trouble. Manure, fodder and infested animals are, I think, common means of distributing such diseases. Dirty pools, grazing over sewaged meadows, etc., are perhaps the most dangerous conditions, but by the above means of distribution the horses in towns were almost as frequently the subjects of intestinal parasitism as those in country districts.

Intestinal workers injure their hosts or induce disease by consuming food, by extracting blood, by irritation causing catarrh, colic, diarrhœa, increased secretion and peristaltic action, nervous disturbances as vertigo, epilepsy, embolism, ulceration and blood-poisoning, sometimes perforation and ruptures, mechanical impediment by large numbers, etc. The effects in most instances will depend on their numbers, and naturally on the habits of the worm. Some are bloodsuckers, and in addition to the ordinary effect of irritation induce anæmia of a very marked character. Some live free in the lumen of the alimentary tube, some are firmly attached to the mucous membrane, others bore their way through the membrane and pass part of their existence underneath it.

Professor Penberthy then proceeded to describe the more common intestinal worms inducing disease in the horse, ox, sheep, pig, dog, and cat, touching on points of practical value in connection with their life history, pathogenic effects, symptoms and treatment.

Commencing with the worms of the horse, he first mentioned the *gastrophilus equi* or stomach bot, which in small numbers resides, during the winter months, in the stomach of the horse, without doing apparent injury to its bearer, leaving him in the late spring to become developed into *œstrus equi*. This parasite, however, may give rise to disease by thinning the walls of the stomach and predisposing to rupture, also by passing from the stomach in large numbers and causing impaction, and even rupture, of the bowel. It sometimes interferes with digestion, and induces general irritability and debility of the host. Its presence can only be definitely determined by its appearance in the fæces. Solution of iodine, carbolic acid, and glycerine and turpentine the speaker had found most efficient remedies. Other bots infesting the intestines were brought under notice.

The strongylus armatus or palisade worm, in some countries credited with inducing 85 per cent. of the cases of colic in horses, was then described. The Professor said he believed that in this country this worm caused more disease than was usually attributed to it. It was in its adult state specially adapted for boring into the walls of the intestines, where it frequently existed in large numbers and produced great irritation. In its immature state it was supposed to reside in the arteries. It often induced aneurism of the anterior mesenteric artery, and serious intestinal disturbance by embolism, and by its wandering habits. Colic, anæmia and diarrhœa were among the first prominent symptoms

induced by the adult worm. He had been surprised at the large proportion of aneurisms of the mesenteric arteries he had found on *post-mortem*. The lecturer exhibited portions of internal organs showing extensive embolism by these immature parasites, which had become calcified in various situations supplied by branches of the mesenteric arteries. This strongylus armatus is sometimes passed with the fæces, and examination of the dejecta was consequently of importance. With the older practitioners this practice was very common, and he believed much value attached to it as a means of diagnosis.

The strongylus tetracanthus was then introduced. This parasite, which from all the sources we possess for forming an opinion appears to have been formerly confined to certain low lying and wet districts, now had a wide distribution, and induced serious losses in town as well as country. Young horses were most commonly affected, probably because they grazed and spent their lives on pastures; but adult animals by no means escaped its effects. Little is known of its life history outside its equine host, but its habits of piercing the intestine, coiling itself up under the mucous membrane, and of blood sucking were dwelt on, as were the symptoms of anæmia, diarrhœa, general unthriftiness, pendulous abdomen, the presence of the small round worm in the fæces, etc. An outbreak of disease due to its attack in which ten animals had succumbed, was described. Attention was directed to the fact that while this worm was of a very small size it often produced serious effects. It then required careful looking for, and something appeared like blood marking in the mucous membrane of the intestines. In the treatment of this condition the Professor attached great importance to the necessity for keeping the animals warm and avoiding drastic agents.

The Ascaris Megalocepha and the tapeworms, though in small numbers doing little appreciable harm, in larger numbers induced colic, vertigo, etc. Epizootics of disease due to these worms were described.

The intestinal parasites of the other domesticated animals, particularly the strongyle producing diarrhœa and anæmia in cattle, the *tænia expansa* and *strongylus contortus* of sheep, *ascarides* of the pig, dog, and cat received a share of attention.

Professor Penberthy spoke as to the value of drainage, the disuse of dirty pools, the use of lime and salt on pastures, the latter as an article of diet, the importance of not grazing pastures infected with parasites with animals which are naturally their hosts, and also of the necessity for the frequent use of medicines of a vermifuge nature even among apparently healthy animals. The properties and applicability of various anthelmintics were discussed. Numerous specimens of each of the parasites were exhibited.

Discussion.

Mr. TRIGGER said the subject was rather difficult for them to grasp, but that parasitic life played an important part with the diseases of animals he thought was a fact they would all recognise. Referring to the simple subject of bots, the lecturer had told them they would produce stoppage. Only a few months ago he was called upon to make a *post-mortem* examination of a colt, yew poisoning being the expected result. He was very much at a loss to find the cause; he would not say he did find it, but what he did come across was a very bad condition. There was perforation of the mucous coat of the stomach and in many other places. He took the piece of the membrane so attached and sent it to Professor McFadyean, from whom he received a reply stating that he had shown the specimen to his class, and that there was no doubt that bots had produced the perforation. He did not agree with the treatment of calves as at present advocated. He thought as long as they were left on the pastures at night they would do no good, and no success

would attend the treatment. He believed the proper thing was to give the animal something which would nauseate them and they would then pass away.

Mr. COE said he would like to ask Professor Penberthy the best treatment of disease due to strongylus tetracanthus.

Mr. WARTNABY also joined in the discussion, and said he thought very differently now with regard to parasites than what he had thought before. As tobacco had been suggested, he would like to ask the professor whether he would give it by mouth or only as an enema. His experience with regard to calves was that if you get a late one which is delicate, if once the parasites get hold of it it was sure to die. With regard to sheep, hundreds were lost through the ravages of the parasites; when at home he used to winter about 250 lambs, and for the past four or five years they lost about 50 lambs from this disease. It would carry off some of the stronger lambs and leave a good many of the weaker ones. He almost differed from the Professor with regard to fits in pigs, which he understood him to say were always due to parasites. Several weeks ago he was called to see some young pigs, and was told one had died and that four more of them were attacked two or three times a day. After making some inquiries he learned that some of the pigs had fits about the same time the year before, and that they were locked up in a stye and not allowed to run. The owner put a bucket of wash in the trough and the pigs were immediately seized with the fits. He gave them a dose of sulphate of magnesia and changed the food, and after giving them more exercise they were never subject to them again.

Mr. MASON said he had no special remarks to offer, but he could only endorse and thank the professor for the extraordinary statements he had brought before them. He took great interest in the dog and knew that the intestines of the dog were sometimes one mass of parasites. He had listened attentively to the address and was only sorry that he could not enter into the details.

Mr. CARLESS said it had given them great pleasure to listen to the very instructive address. He felt quite like a student again in hearing details of the disease. These had called to mind very vividly lots of instances he had met with in his practice which the professor had described, and during the last spring, cases of very considerable importance came within his practice, the parasites being the cause. The worms had produced ravages which generally ended in death. What they would have to do was to build up the system by administering blood-producing foods, and small doses of medicine which were calculated to make the habitat of the parasite objectionable—too distasteful for it to stop. He fully endorsed the remarks made by the Professor, to the effect that warmth was necessary in the treatment of animals.

The PRESIDENT then summed up the discussion. He said the Professor's address was one of the most interesting he had ever heard. Like Mr. Carless he felt again a student, although he admitted he had forgotten some of the names of the parasites. He was particularly interested in one of them, viz., the strongylus tetracanthus, he having had several outbreaks of disease caused by this parasite.

In reply Professor PENBERTHY said it was not necessary for him to say that he had not attempted to exhaust the subject, which would provide material enough for a four years' course. He had only tried to touch on a few points which he regarded of special interest to the meeting. In reply to Mr. Trigger, he thought chlorodyne was an anthelmintic partly by virtue of the peppermint it contained. In Mr. Coe's case of disease due to strongylus tetracanthus, he would keep the the animal at rest, as it was necessary to conserve the animal's strength. Small doses of turpentine in milk, and preparations of iron in conjunction with artificial heat, were among the best curative measures. Referring

to the remarks of Mr. Wartnaby, he had often seen epilepsy in pigs associated with ascarides. In the administration of tobacco as an anthelmintic, some care was necessary; the speaker usually commenced with four or five ounce doses of an infusion of one part tobacco to twenty of water. He was very pleased to listen to the remarks of Mr. Carless; he agreed with this gentleman as to the advisability of changing animals from low-lying lands infested with worms, but it was necessary to exercise some discrimination. Great good was likely to follow moving animals on to high land when conditions did not favour the life and development of worms, but there was some danger in removing infected animals on to pastures and places where conditions favourable exist of contaminating them.

In conclusion, Professor Penberthy said he was very pleased to have had the opportunity of coming down to the meeting, and very grateful for the kind manner in which they had received his rambling remarks on this subject. He hoped it would have the effect of exciting an increased interest in helminthology, as he would venture to state that there was no study more likely to repay the practitioner and to allow his services to effect greater good.

On the proposition of Mr. JONES, seconded by Mr. SMITH, a vote of thanks was accorded to Professor Penberthy for his address.

The SECRETARY moved that "our hearty thanks be given to the president for his address, and that he allow it to be printed, together with that of Professor Penberthy."

Mr. WARTNABY seconded and the motion was carried.

The CHAIRMAN said he was much obliged for the vote of thanks.

The company afterwards sat down to a knife and fork tea, and a pleasant evening was spent.

J. H. DAWES, *Hon. Sec.*

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of the Association was held at the Royal Hotel, Southampton, on the 28th June. The meeting was preceded by a luncheon at which the only toast given was that of Her Majesty the Queen, proposed by the President (Mr. T. B. Goodall, Christchurch), with appropriate reference to Coronation Day, and to the birth of the infant prince. At the meeting the President presided, and amongst those present were Messrs. J. D. Barford, J. W. Barford, and C. J. Gould, Southampton; J. T. Burden, Beaulieu; J. B. Tutt, Winchester; J. F. Simpson, Maidenhead; J. T. King, Bournemouth; E. W. Baker, Wimborn; J. V. Blake, Ryde; and C. Pack, Lymington; Hon. Sec.

Letters of apology for non-attendance had been received from Sir Henry Simpson, Professors Edgar, Axe and Penberthy, and Messrs. Redford, Golledge, Knott and Carter.

Some time was occupied in observing specimens of bacillus anthracis, shown under microscopes by the President and Secretary (the slides of bacilli anthracis were lent by Prof. Penberthy); the President also showed specimens of parasitic acari.

Mr. J. B. TUTT of Winchester, showed as a morbid specimen, three large calculi which he had taken from a horse that had died under his charge, and stated that although the calculi were very large the horse had worked well and shown all the appearances of perfect health up to a couple of days before its death. An interesting discussion followed.

The PRESIDENT exhibited the skull of a horse which had no turbinated bones on one side. In order to more clearly show the malformation, he had

made a section of the skull, and he also showed a section of a normal skull. The case, he said, was that of a seven years old forest pony. After the death of the animal food was found firmly impacted between the last two upper molars of the left side, the impaction extending low down into the alveolus and sinus, the last tooth being in consequence turned round in its alveolus, the normal outer aspect of the tooth facing backwards. There were no turbinated bones on the left side, the nasal chamber and the sinuses being continuous. The maxillary turbinator was represented by a fold in the mucous membrane and erectile tissue only. There was a firm, bony tumour or growth which had been adherent to the septum and thus occluded the olfactory and sinus meati, the lower or respiratory meatus being alone free. The ethmoidal turbinator was represented by a fold of membraneand erectile tissue extending the whole length of the nasal chamber. The bony tumour which originated from the inner face of the superior maxillary bone at a point corresponding to the anterior edge of the infra-orbital foramen, has no connection with either of the turbinals, but is evidently a substitution for the large free cell usually found at the inferior extremity of the maxillary turbinated bone, and on closer inspection all the outer aspect of the maxillary bone is marked by elevations and depressions, pointing to the probability of the animal at some time of its life having been the victim of a serious accident. The bony tumour corresponds to the place of the normal attachment of the maxillary turbinator to the maxillary bone, and is hypertrophied and exaggerated, probably that nature may thus protect the otherwise exposed sinuses from the deposition in them of foreign matters. In life the pony had been totally blind in the off eye. The mare in apparent health, had been at œstrum and had been turned out with a stallion. She had been partially broken in. On the morning of the 15th April she was seen to be feeding and well, but it had been noticed that she was in a state of excitement. At about 5 p.m. she was found down in the field and unable to rise. Mr. T. B. Goodall saw her at 8.30. The pulse was normal and there was no symptom of pain. As she was unable to rise he had her moved over on to her other side. This induced a regular epileptic fit, the limbs being stretched out so rigidly that he half suspected tetanus, and gave the mare chloral. She was easier the next morning, but a movement from one side to the other induced a return of the nervous excitement, as also did any noise. At times her legs would keep in motion as though she were trotting and galloping, and then they would be exceedingly stiff and rigid. He had then come to a conclusion that all the symptoms were due to exceptional nervous excitement, with some possible injury to the brain in her futile endeavours to rise. The pulse was still normal, and he continued the chloral. On the 17th the mare was much easier and ate and drank freely, so he discontinued the chloral and made an attempt to sling her, but when up she had no use in her legs whatever, so he let her down again. On the 18th the mare was worse, the pulse getting irritable and quick, and he advised that she should be destroyed. After death he made an examination, and after finding the abnormalities mentioned in the teeth, and in the nasal chamber and sinuses, and considering also that she had been blind, he was vexed to think that the brain had been shattered by a charge of shot, for it was more than probable that some abnormality would have been found to account for the paralysis, and which would have made the case much more interesting and instructive. Whether he would have made a more satisfactory diagnosis if he had seen the mare under more favourable circumstances he could not tell, but it must be remembered that she was down in an open field when he first saw her, and it was only with the aid of a lantern, very dimly burning, that his observations were made, though from the first he had no hesitation in attributing all the symptoms to nervous derangement. The point of most importance was that in this case there was practically no division between the nasal chamber and the sinuses.

Through the kindness of Mr. C. Huish and J. V. Blake, Esq., M.R.C.V.S., of Ryde, the Secretary was able to place before the meeting the Blake castrator and the Huish-Blake castrator.

Mr. BLAKE, who was present, spoke of the excellent results he had since he had adopted the instrument for castrating all kinds of animals, and answered many questions put to him by the members. At the close hearty thanks were accorded Mr. Blake and Mr. Huish for their kindness.

New Members.

Mr. A. J. Blake, of Bournemouth, and Mr. R. W. Dawtrey, of Chichester, were nominated for membership of the Association.

Insurance Companies and Examination Fees.

At the close of the exhibition of morbid specimens the meeting proceeded to the consideration of the circular letter which had been sent from the Eastern Counties Veterinary Medical Association respecting the fees usually paid to veterinary surgeons by insurance companies. (This has already appeared in our pages.)

Mr. J. W. BARFORD said he could speak very feelingly on the subject. He was veterinary surgeon to an insurance company and he had been asked to make an examination. He had travelled miles to make the examination, and he had spent 4s. and all he had got from the insurance company was 3s. He thought they ought to be protected. He wrote and told the company that he would not go again. He did not know whether any other gentleman had had an experience of the same kind, but he thought it was far from right that they should be taxed with that kind of thing.

Mr. SIMPSON sympathised with the remarks of Mr. Barford, and to make the discussion regular he moved the following resolution:—"That the members of this Association regret that insurance companies cannot see their way to offer veterinary inspectors a proper remuneration for the examination of horses and cattle for insurance."

Mr. C. J. GOULD seconded the proposition. He had been to Beaulieu Green to make an examination one Sunday night. The tolls had amounted to 1s. 2d. and he had spent four or five shillings, but the insurance company would only give him half-a-crown. He thought they should demand their proper fees. If the examination was worth anything it was worth paying for. To travel eight miles to make an examination and to receive half-a-crown was absurd.

Mr. PACK said he thought they were all of one mind with respect to the inadequacy of the payment, but after all the insurance companies were candid. They told you what the fees were, and if the members of that Association said they would not accept them, the insurance companies knew that there were other people who would.

Mr. BARFORD: They don't think of the distance we have to travel. They do not know.

Mr. PACK quite agreed with the remarks as to the smallness of the payment. He was asked to go four miles from Lymington to examine a cow, that cow was in the last stage of tuberculosis. He sent word that it was not a fit subject for examination. He did not tell them the reason why, but they sent him a fee of one-and-sixpence. But sometimes it is a matter of obliging a client as much as the insurance companies.

Mr. J. W. BARFORD: Don't you think they should be made acquainted with the distances. In two cases I had to go the other side of Bursledon Bridge. It cost me 1s. 10d. and I received a fee of two shillings. I think it is absurd.

Mr. PACK said that was better than what had happened to him. He had once gone a considerable distance to make an examination of a cow that was

proposed for transfer of insurance policy, and he had charged half-a-guinea, but they had sent him only a shilling. He wrote back for an explanation and the company replied telling him that the whole premium paid for the cow was one-and-sixpence and they had sent him the lion's share of that.

Mr. KING said he was requested by an insurance company to make an examination at a place called Heathfield Brickyard, in Dorsetshire, which he believed to be in another inspector's district. At any rate it was a very considerable distance from Bournemouth and the fee was to be two shillings.

Mr. TUTT said that he had been called upon by Mr. Shenton, of the Imperial Insurance Company, at Winchester, who asked him if he would be a veterinary inspector under his company. He asked what the fee was, and when he was told that it was three-and-sixpence he absolutely refused.

Mr. J. W. BARFORD: And I don't blame you either.

Mr. SIMPSON said that it was very well known that insurance companies had to take very small premiums considering the risk they ran, although it was a large one if the insurance was not called for, and they could not go to the expense of the ordinary guinea fee, and if they did not accept the terms of the companies others would do so readily. It gave some sort of status to a man to hold the appointment of inspector to a live stock insurance company however small the fee might be. He did not see that any good could come of passing a resolution, unless it was one such as he had proposed, to the effect that the Association regretted that the insurance companies could not see their way to paying the veterinary inspectors a more remunerative fee. If a resolution of that kind could not do any good he could not see how any good could be done. The insurance companies were obliged to take small premiums in order to get insurers to take out policies in their offices, and they could not afford to pay the ordinary fee for inspection. It was a matter of business. He would only advise members of the Association to make the best terms they could with the companies. It was not an uncommon thing in the medical profession for fully qualified men to take small fees. He had in his mind a gentleman, a fully qualified medical man who had printed on his blind. "Medicine and advice, one shilling." That man was in practice now, but, to use a common expression, he had "got his foot in," and he had removed the blind and now charged the same fees as any other practitioner. He failed to see what could be done by the Association. It was a matter for individual members to make their own terms with the companies, and if any member found that it was being used to injure his practice in his locality let him simply decline it.

The PRESIDENT said that his own view was that the matter was a purely voluntary affair between the veterinary surgeons and the insurance companies. They were not compelled to take the fees. He had been entirely against the insurance companies until a few months before, when a secretary and manager called upon him and explained that the company did not wish him to make special visits and exhaustive examinations, but simply to see a beast when he was in the neighbourhood and to tell the company whether it was healthy or not. That was all they wanted. He replied, "If that is it, I will examine when I am in the neighbourhood." He certainly did not intend to travel five miles to make an examination.

Mr. J. T. KING said that in some cases the companies asked for valuations. If it was to be understood that any sort of an examination would do, that would put a different complexion on the matter.

Mr. GOULD: But if the animal dies the next week you will have to pay for it.

The PRESIDENT: They cannot afford to pay us full fees, and I do not think that any protest will do any good. The companies cannot afford to pay any more. He was exactly of the same opinion as the speakers who had preceded

him—that they were inadequately paid by the companies, and he did not intend to put himself out of the way to make the examinations. He had had notice to attend an animal, but he had not been in that neighbourhood for some time, and he had had a letter from the insurance company asking him why he did not make the examination.

A member suggested that if they refused to do the work outsiders would take it, and they ought to keep outsiders from doing the work.

The resolution given above was then put to the meeting and carried *nem. dis.*

Presidential Address.

The PRESIDENT said that he observed that there figured on the agenda the words "President's address," and it would be necessary for him to detain them a little time. But, happily, it was not necessary for him to say a great deal, because Mr. Hunting, in the last number of *The Veterinary Record*, had given a history of the profession during the last fifty years, and it was really a history of the life of the profession during that time. In the few words he would say to them, he wished to emphasise the fact that their profession consisted of individual members, and although the body might grow healthy and lusty, and present all the appearance of success, yet the object for which such a body as this Association was formed was to improve and maintain the status of the profession to which they belonged, and this must depend upon the conduct of individual members of the body. Wherever a veterinary surgeon was placed, he should strive to make himself looked up to by those around him, and to cause himself and his profession to be respected. They must show themselves worthy of the responsibility that was placed upon their shoulders, and that they had the welfare of the animals under their charge at heart. It was not a mere question of fees, although the question of remuneration was one which ought not to be disregarded by members, but it was a question of the honour of their profession. In the first place they should show that they were perfectly competent to treat disease, and he thought it was generally acknowledged that they were so. And they should not allow themselves to take a low position in the society in which they moved. Their motto should be "Excelsior." Although this might bring them a feeling of loneliness, yet he would urge upon them to persist in it, and to refuse to mix in company lower than themselves. If they held themselves aloof from lower company, and mixed only with educated men and gentlemen, they would increase the respect in which the profession generally was held, and they could not do that if they lowered the standard of their associates. They should always keep in view the desire to raise themselves. And that brought him to a question that concerned the profession—the granting of the Fellowship degree. The degree was a splendid thing. It was something that a man could look forward to as he advanced in life. When the degree was first granted there were certain privileges attaching to the holding of it, and amongst others the eligibility to serve on the Council. But after they had passed the Fellowship examination they were calmly told by the Council that these privileges were taken away from them. That was a distinctly retrograde step, and this was shown by the fact that this year only three members presented themselves for examination for the degree. He thought that was a mistake, and he trusted that it would be rectified. There was another question that he wanted to touch upon, and that was the four years' course of study. The question arose, "Was the profession worth it?" If to be a member of the profession was to be worth the money that they must spend to get into it, they must endeavour to raise it to the position of the sister medical profession. Here, again, he came to the question of the conduct of individual members as the only lasting manner in which the status of the

profession could be raised. A good motto for each of us in this year of our jubilee, and taken from the old Book, is—"Not as though I had already attained, either were already perfect."

And with regard to country practitioners who, as he had said, ran some danger, because of the loneliness of country life, of finding companionship in society which was not of their own level, and in order to avoid that danger there was nothing in the world like taking up a hobby of some kind, something which in one's leisure hours would compensate for the lack of company. If they took up a hobby it was surprising the amount of interest and beauty and pleasure of life that they could get out of it. For himself he never found time for idleness, but whenever he had five minutes to spare he occupied them in continuing his studies.

Since he had taken up his hobby, life had passed more pleasantly with him, and he felt that he was doing some little good in his day and generation. He had had the privilege of preparing a series of horses' teeth for the British Museum, and had received much encouragement from Sir William Flower. That was the kind of satisfaction one got from his hobbies. What they wanted to guard against was the settling down and doing nothing new. He remembered that when he had his diploma he thought that there was nobody like him in England, but he soon found out how very little he really knew. They should always be taking up something, always be learning something. They should never sit down as though they had done their work, as though they had "already attained." Let them bear in mind the word from the good book, "It is the glory of God to conceal a thing, but the honour of kings is to search out a matter," and when they had discovered anything, let them publish what they had found; let them tell it to their fellow-members of the association. Their light would shine none the less by communicating light to others. If they did this they would have the satisfaction of knowing that they would make the profession better than they found it. In conclusion, he would thank them for having given him that honourable position in the association. He trusted that they would have a good year, and that the members of the association would support the meetings better in the future than in the past.

"On Anthrax," by Professor Axe.

Discussion.

Mr. Pack, in opening the discussion, said although anthrax could be produced on any soil he thought it was much more likely to occur on low-lying grounds. His experience was that the susceptibility of animals on low-lying grounds was greater than those feeding on higher pastures. His opinion was that the low-lying lands were favourable to the development of the anthrax germs. And he thought that the spores might exist in such pastures from year to year, for when a case of anthrax occurred it was often found to be in pastures in which there had been previous cases. It was remarkable how fatal the disease was amongst animals. When anthrax attacked a human being it often became localised and could be treated locally, but in animals it usually became generalised. He thought that animals most frequently became infected through the alimentary canal or in the neighbourhood of the throat. He thought so because they had seen in animals standing side by side, that one would be taken with the disease and none of the rest would have it. So that he thought the disease was more likely to be taken through the alimentary tract than by inhalation. Still, it was possible that the disease was conveyed by flies, which might carry the bacilli from one animal to another.

The President pointed out that this was a fallacy. The fly that stung was not the same as the one that sucked juices from a wound.

Mr. Pack said that that might be so, but a fly alighting on a wound on one animal and again on a wound of the next might carry the contagion from the

blood of one to the other. With regard to the recognition of anthrax, it was most important that they should have an early means of detecting this. At present it was only possible to be quite certain when the anthrax bacilli were observed under the microscope. Then with regard to slaughter. They had heard a good deal not long ago about the advisability of slaughtering cattle, but he could never see any reason why sixty or seventy head of cattle on a farm should be destroyed because one or two animals had died of anthrax. He had known one farm where, if this had been done, they would have had to slaughter 150 beasts which were perfectly healthy. Professor Axe thought if it was necessary to kill beasts the quickest and the most painless way was by the injection of hydrocyanic acid into the system. Professor Penberthy was of that opinion. Mr. Redford did not consider that was necessary, but said that if they stood some distance from the animal and shot it direct there would be very little blood. He (Mr. Pack) found the same thing. He had shot a bullock standing twelve yards off, a few days since, and there was no blood at all. It was not necessary to have a great deal of blood when shooting an animal. As soon as the animal was shot it was necessary to get rid of it at once. Cremation was the best plan, but if that could not be obtained the next best thing was to bury the body as deep as possible in quicklime. There should not be any opening of carcases. With regard to the spread of disease he felt sure that the germs of anthrax continued in the grass for as long as eighteen months or a couple of years. They very seldom had a case of anthrax at Lymington, but when they did it was always found in the same place where there had been cases of anthrax before. They were told that quicklime was a remedy, but how could they effectually quicklime a forty-acre field? The methods adopted for prevention must be very wide.

(To be continued.)

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

At the Council Meeting held on July 25th, Mr. Ashworth reported that a desire had been expressed by the Chairman of the Gloucestershire County Council that a separate reprint should be made of the articles on Anthrax by Professors Brown and McFadyean in the current number of the *Journal*. The Committee had referred the matter to the Journal Committee, with the expression of their opinion that such a reprint would be desirable, but that the authors should be asked to revise their articles so as to adapt them for publication in pamphlet form. The Committee had discussed the question of the advisability of in future publishing the reasons for the veterinary rejection of stallions and brood mares under Regulation 44 of the prize sheet; and eventually it had been agreed to recommend that at future Country Meetings the owner of an animal rejected under this regulation, upon his application, be furnished with a copy of the veterinary certificate. The Committee also recommended that in future the names of the veterinary surgeons who are to be engaged in the examination of the horses to be exhibited at the Society's Country Meeting should be previously submitted to the Veterinary Committee for approval, and then published in the *Journal*, together with the names of the judges. Letters had been read from the Farriers' Company, communicating the following resolution of the Registration Committee under the scheme for the National Registration of Farriers or Shoeing Smiths, which had been adopted by the Court of the Company, and asking for the Council's approval thereof, in order that the scheme might be revised accordingly:—

"1. That provision be made for registering 'doormen' in a special list as registered doormen, at a reduced fee.

"2. That the Registration Committee consist of ten members of the Farriers' Company, six registered men, six members appointed by the Council of the

Royal Agricultural Society of England, and six members appointed by the Royal College of Veterinary Surgeons."

The Committee recommended that the Secretary be instructed to reply that the Council would not raise any objection to the alterations proposed. Under Clause 4 of the scheme, half the Society's six representatives now retired from the Registration Committee, but they were eligible for re-appointment, and the Committee accordingly recommended the re-appointment of Sir Nigel Kingscote, Sir Jacob Wilson, and Mr. Ernest Clarke.

Professor BROWN had presented the following report:—

Pleuro-pneumonia.—In connection with the outbreak of this disease discovered near Margate in April last, 311 cattle were slaughtered, of which eight were found affected with the disease. A few days ago another outbreak of pleuro-pneumonia was discovered in Middlesex, in the Hendon district, close to premises where the disease existed last year. The history of this case has not yet been made out.

Swine Fever.—This disease is still very prevalent in many parts of England, in some parts of Wales, and has recently been reported in several counties of Scotland. During the seven weeks ended July 14th, 1,112 pigs died from swine fever, while 12,765 pigs were slaughtered as diseased or having been exposed to the risk of infection. In addition to the above, 222 were slaughtered as suspected, but on *post-mortem* were found free from the disease.

Anthrax.—During the seven weeks above referred to, 53 outbreaks of this disease were reported in Great Britain, and 122 animals were attacked, of which 113 died and eight recovered.

Rabies.—Of this disease 32 cases were reported in Great Britain in seven weeks; 27 of these were in England and five in Scotland.

Abortion.—It is proposed to commence the scientific investigation at once by placing under observation at the college some cows from an infected herd, and others from a herd in which epizootic abortion has not appeared. Since the committee last met, investigations have been made regarding serious losses among cattle from parasitic gastritis and enteritis. Anthrax vaccine has been supplied for the inoculation of all the animals (horses and cattle) in one farm, and the operations were carried out without any fatality. Experiments have been made with a view to ascertaining the protective value of the Pasteurian inoculation, and further experiments and observations are being made regarding the effect of putrefaction in the virulence of anthrax carcases.

Sir JACOB WILSON asked to be relieved from the duty of acting as one of the Society's representatives upon the Registration Committee of the Farriers' Company, and moved that Mr. Stanyforth be elected in his place.

The Hon. CECIL T. PARKER seconded the motion, which was adopted.

Sir NIGEL KINGSCOTE, in reference to the proposal of the Committee that a reprint should be made of the article on anthrax in the current number of the *Journal*, said it was desirable that, if such a reprint were made at all, it should be undertaken by the Society rather than by any other body.

Earl CATHCART thought the article was hardly adapted for publication as a pamphlet in its present form.

Professor BROWN explained that Professor McFadyean and himself, as the writers of the short notes on anthrax, had contemplated revising the whole article and putting it into proper form, for the purpose of being published at once, so that the local authorities and everybody concerned might be made aware that they need not cut open the bodies of animals suspected to be dead of anthrax, which was a dangerous and deadly thing to do; but that if they cut off an ear or a foot, and sent it to the Royal Veterinary College Laboratory, it was easy to find out whether the animal had died of anthrax or not. Most of the proposed devices for the disposal of anthrax carcases involved cutting them up, but the safest thing to do was to bury the carcase

absolutely untouched, with the exception of the amputated ear or foot, that might be sent to the College for examination. Within a short time, certainly within three weeks, all risk of danger of infection from the buried carcase would have disappeared. Those were the two points to which it was desired that as much publicity as possible should be given.

Earl CATHCART said that there would not be the least objection on the part of the Journal Committee to the publication of this information in the form of a leaflet.

It was accordingly decided that Professor Brown should be asked to prepare a leaflet giving the desired information, for immediate distribution by the Society amongst those interested in the subject.

Professor BROWN, in reference to the proposed submission of the names of the veterinary inspectors to the Veterinary Committee, said it was perfectly agreeable to him that such a course should be adopted. He had always endeavoured to obtain the best professional skill for the purpose. At the Cambridge meeting he had engaged the services of Professor Axe, who had had more than a score of years' experience in the examination of horses; Professor Penberthy and Professor Macqueen, who were also constantly engaged in the same way at the Royal Veterinary College; the President of the Royal College of Veterinary Surgeons (Mr. Wragg), who was a London practitioner of large experience; Mr. Lepper, whose name was historical in connection with horses; and Mr. Duguid, who had long been associated in work for their Society. In the majority of the cases, he (Professor Brown) himself had also had the opportunity of seeing and noting the unsoundness certified by the veterinary surgeons.

Mr. ASHWORTH said that the Veterinary Committee not only had not the slightest objection to publish the names of the veterinary surgeons in advance, but were desirous of sharing with Professor Brown the responsibility for their selection.

Mr. DENT said that he had moved in committee that the names should be published. They had recently taken upon themselves to publish the names of the judges, and it was desirable that the names of the veterinary inspectors should also be published. It was important to have all possible publicity in these matters, in order that people might not go about the showyard saying that the horses were examined by nobody knew whom, and were rejected for nobody knew what.

Notes and News.

A SMALL FOAL.—What is believed to be the smallest foal born in England has been dropped in the Ladies Hope's Shetland pony stud at Chertsey. The little animal in question is a beautiful dun colt, 19½ inches high, and weighs only 18 lb. The dam stands only 33½ inches, and has for her grandsire the famous Lord of the Isles.

THE PASTEUR INSTITUTE.—The *Annales de l'Institut Pasteur* state that the total number of persons under treatment during the months of April, May, and June was 417, of whom 54 had been bitten by animals experimentally proved to be mad, 210 by animals declared by veterinary certificate to be mad, and 153 by animals only suspected of being so; the bites having been inflicted in 399 cases by dogs, and in 18 by cats. Three deaths are reporetd as having occurred during that period, one being that of a patient who was under treatment as far back as October of last year.

CATTLE PLAGUE.—The cattle plague has once more appeared in Transcaucasia, and has raged in almost all the districts of the Tiflis Government, as well as that of Kars. The disease gains ground every day, and is causing anxiety. It attacks by preference the oxen used for working, and the peasants are obliged to unyoke from the plough or carts the animals, who

refuse to continue working, and lay down. With regard to the disease in Russia, it is stated that in January of this year 825 head of cattle were killed and 4,172 died of the disease; in February, 272 were killed and 2,539 died; in March, 24 were killed, and 2,112 died. The disease was widespread in the Caucasus, in Stavropol and Kouban; in Trans-caucasus, in the governments of Tiflis, Jelis-awetpol and Kutais. The number of animals attacked by the Siberian pest appears to be on the decrease.

BRITISH INSTITUTE OF PREVENTIVE MEDICINE.—The trustees of the late Mr. Richard Berridge have handed over to the Institute the residue of the legacy amounting to over £20,000, for the purpose of building and endowing a laboratory for the chemical and bacteriological examination of water supply and the investigation of processes of sewage purification. A temporary laboratory has been fitted up in order that the work may be at once proceeded with, and the permanent laboratory is in course of erection at Chelsea. Mr. Joseph Lunt, B.Sc., F.C.S., formerly Assistant to Sir Henry Roscoe, has been appointed by the Institute to carry on this work under the Director's supervision. The Institute is prepared to undertake the bacteriological and chemical examination of any samples of water which may be submitted. The Institute is also prepared to undertake the bacteriological or pathological diagnosis of any pathological material. Dr. Ruffer retains charge of this department. The demand for this kind of work has so much increased, that a specially trained bacteriologist has been appointed to work under his direction. Particulars may be obtained by writing to the Director at the temporary offices, 101, Great Russell Street, London, W.C.

A CALF CHOKED BY AN ADDER.—The following rather extraordinary accident is reported from Chawleigh, in the *North Devon Herald*, of August 16th. A fine calf belonging to Mr. Thomas Sage, of this village, was a short time since placed in a linhay erected in a meadow which had been laid up, and a small portion of which surrounding the shed was fenced off as a run. One morning the animal, which hath hitherto appeared quite well, refused to take its breakfast of milk, and was perceived to be in great pain, afflicted with shortness of breath. The case received immediate attention at the skilful hands of Mr. James Dilling, but to no purpose. The difficulty in breathing increased, and the animal appeared to be suffering from an acute attack of inflammation. This opinion was shortly confirmed on the arrival of Mr. West, veterinary surgeon of Chulmleigh, and hopes of the calf's recovery seemed very doubtful. Lotion was applied externally, however, and the calf drenched with a strong draught of physic. On being released the patient commenced coughing, and, to the astonishment of those present, ejected a large adder from its mouth, measuring over a foot in length. The reptile was dead, and its expulsion gave instant relief to the poor sufferer, which in a few minutes recovered. Apparently a small quantity of grass had previously been cut for the calf and placed in a heap, and there the adder must have been concealed before it was swallowed.

CAMELS IN AUSTRALIA.—*The Australasian* says that few people are aware of the extent to which camels are used in the interior of Australia as beasts of burden. The roads to the far-back stations are often not practical for horse or bullock teams for many months together, and the delay in getting their wool to market led, some time back, to a syndicate of pastoralists being formed in Queensland to import a large number of camels to do the work of transporting the wool to the nearest railway stations. One of the pastoralists remarked to me lately, "Had it not been for the camels my wools would not have reached Brisbane yet; as it is, the wool is now in London and sold." The proprietors of the camels, finding the carriage of their own wool did not furnish sufficient employment for them, did carrying work for pastoralists who were situated like themselves in country difficult for teams to traverse. Lately,

they had been carrying wool from stations beyond Thargomindah, where some of it has been shorn over eighteen months. The carriers have a decided objection to the use of camels in transport work, and have shown their objection at times in a pronounced manner. They appear to think that the wool should remain on the stations till a season comes when the teams can travel, but the sheep owner has a different idea on the subject. As threats have been freely made of injury being done to the camels, the owners applied to the Pastoral Union at Charleville to assist in obtaining police protection for the animals. This the local union have declined to do, and hence the indignation meeting of the pastoralists in the neighbourhood of Thargomindah. There are large areas in the interior of Australia in which the camel will ever be the only means of transporting goods in normal seasons. In a good season, which is the exception, teams may do the work.

TUBERCULOSIS IN THE UNITED STATES OF AMERICA.—The Bureau of Animal Industry, in America, in carrying out the inspection of meat for the export trade, has collected certain data which, up to a certain point, helps us to gain some idea of the percentage of cattle affected with tuberculosis. It appears that out of 2,270,000 animals slaughtered at the packing centres from May, 1891, to March 1892, no more than ·02 per cent. were found to be affected; but then it must be borne in mind that these were nearly all young steers, and in consequence of being so much in the open air they do not contract disease so readily as animals who are confined in buildings which are not always properly ventilated. Experience has shown that disease breaks out with greater frequency and with greater severity among stall-fed cattle than in the case of those which run at large. The Agriculture Department of the University of Wisconsin points out that of the 12,000 cattle killed in England under the Pleuro-pneumonia Act in the year 1890-91, 12 per cent. were found to be tuberculous, and while 16 per cent. of the inspected animals were cows, 1·5 per cent. only were males. In the year 1888, Herr Röckl, produced a most exhaustive report on the spread of tuberculosis in Germany, and his figures, too, showed that cows were more subject to infection than males. Out of 72,000 bulls, 2·6 per cent. were tuberculous; out of 36,000 steers the percentage was 1·2, and in the case of cows it was 6·9, while out of 375,000 calves ·01 per cent. only were affected. A still more serious state of things was found when Herr Röckl dealt with 50,000 head of tuberculous stock. Of these 5·7 per cent. were bulls, 5·6 per cent. steers, 68·6 per cent. cows, and ·04 per cent. calves, so that for every tuberculous calf there were about 14 infected steers and bulls and 169 cows.

A FEAT IN VETERINARY SURGERY.—Under this heading the following appeared in the *North British Agriculturist*. It deserves to be noted that the polled Angus bull "Enthusiast" of Ballindulloch, which won for Mr. Chalmers, Aldbar, the champion prize and the Duke of York's medal at the Highland show last week, is the animal of which so much was heard twenty months ago, through having been condemned by the leading professors of veterinary science in England, as being affected with an incurable tubercular tumour in the throat. "Enthusiast" carried first honours in the two-year-old class at the "Highland" at Inverness, where he was purchased by Mr. Chalmers for 250 gs., and shortly after being brought home to Aldbar, it was discovered that he had a swelling in his throat, which swelling rapidly grew worse, and the animal appeared to be in a hopeless state. A number of eminent veterinary professors were summoned to see him, and they all shook their wise heads, and said it was a clear case of tubercular tumour, which was quite incurable. But his breeder, Sir George Macpherson-Grant, called in Professor Williams, who again differed with his professional brethren, as he had often done before, and he staked his reputation on the assertion that the tumour on the animal's throat was not of tubercular nature, but, on the other hand it was a clear

case of actinomycosis or "ray-fungus." He further asserted that he would take in hand to cut out the tumour, and thereby restore the animal to perfect health; amd as it seemed a case of the animal dying at any rate, "Enthusiast" was sent to the New Veterinary College to be operated upon by the Principal. The operation was successfully performed, with the result that in a month's time the animal returned to his work at Aldbar, and last week he turned up at Aberdeen, and won the champion prize for Mr. Chalmers. His victorious appearance in the showyard, therefore, was a triumph for the veteran Principal, who has had another triumph just now in the fact that his son, Professor W. Owen Williams, has been elected a member of the Council of the Royal College of Veterinary Surgeons, and that without his even so much as issuing an address or soliciting a single vote. The Principal himself is also a member of the Council, and this is the first case on record of a father and son holding office at the same time as members of the Council of the Royal Veterinary College. Professor. W. O. Williams has had a unique record, for when he took his degree he was the youngest veterinary surgeon who had ever passed as M.R.C.V.S., and he afterwards took the degree of F.R.C.V.S. at an earlier age than anyone who had ever taken that degree before or since. It now remains for him to be elected President of the Royal College of Veterinary Surgeons, and thus become the youngest President of the veterinary profession.

Horse Breeding in Russia.—The *Journal de St. Pétersbourg* of the 30th May (11th June) says that the stud of the Don horses, which was formerly so celebrated, has fallen into a deplorable condition. It was not so long ago that the Cossack horses were the admiration of the whole of Europe, and the Western Powers envied the possession of the Russian light cavalry, which had not its equal in the world, certainly as regards numbers. Immense steppes and vast extent of meadow land permitted of the rearing by the Cossacks of horses, cows, sheep, and goats in immense numbers. The owners of a thousand or two thousand head of cattle looked upon themselves as quite poor, and those who owned tens of thousands were by no means rare. In order to form an idea of the number of horses and cows in the Don region, it is sufficient to state that immense numbers are living in a wild state in the steppes without anyone being tempted to appropriate them. Towards the commencement of the second half of this century these conditions were considerably modified. The population rapidly increased, due in great measure to the foreign element, and to a steady immigration into the Don region of peasants, merchants, and landowners from the neighbouring provinces, who were tempted by the wealth of the district. When the railways were completed, which formed a network over the south of Russia, the steppes were immediately placed under cultivation, and wheat was produced for export. The method of cultivation followed was particularly injurious to the land, which was completely exhausted by constant sowing year after year and then passing to other virgin soil. This uncivilised system of cultivation had the effect of transforming fertile lands into moving sands, and of totally changing the climate of the region. The railways also induced an export trade in horses and cattle, and although at first this conduced to an improvement in the material well-being of the Cossacks by ridding them of their surplus and useless stock of cattle, and thus increasing their pecuniary resources, it later on became a source of very serious privation to them. Foreign countries, and particularly Roumania, exported in large quantities, and still continue to export, the finest horses of the Don, among which were some excellent stallions. The race commenced to rapidly diminish, and to such an extent that at the present moment it becomes indispensable to resort to the most energetic measures to remedy this state of affairs. The Don Cossacks find the greatest difficulty in obtaining mounts, and the military

authorities are becoming seriously alarmed at the position of affairs. The private studs of the Don produce horses which are very valuable, and that is the reason why the Cossacks, not being in a position to pay a high price, generally procure their horses in the Kalmouk studs of the steppes of Manytch. These horses, which are strong and hardy, somewhat resemble the old Don horses, and are largely used for the Russian cavalry.

Correspondence.

ANNUAL LICENSING OF VETERINARY SURGEONS.

SIR,—Some thirteen years have now elapsed since the passing of the Veterinary Surgeons Act, and as time goes on it seems that the said Act does not quite give the profession the powers it should. As the profession demands more time, study, and money of its intending candidates, it is scarcely fair to the freshly-qualified man that he should have to compete with men having no qualification whatever, and as no present Government would ever allow a Bill to be passed, preventing anyone giving advice respecting the treatment of animals, the only way out of this difficulty would be for the Veterinary to combine with the Medical and Dental professions for the purpose of attempting to get passed an Act compelling anyone practising the respective professions to take out an annual license. If the fee of such license be only one guinea, it would benefit the Revenue, and at the same time prevent any non-registered person from practising. No one would be inconvenienced by paying a sum which would be less than sixpence a week; then the Inland Revenue officers would lessen the labours of the Royal College of Veterinary Surgeons, by looking after the interests of the Crown, and of the same time preventing quackery. Lawyers have a somewhat similar Act; surely we ought not to be begrudged a similar privilege! Of course, it would not pay the Revenue to collect only the fees of our own annual license, but combining it with the Medical and Dental professions, it certainly ought to be worth their consideration.

PROGRESSIONIST.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from Veterinary-Captain D. C. Pallin, Army Veterinary Department, Lucknow; J. A. Robinson, Market Deeping; H. Thompson, Aspatria, Cumberland; F. C. Mahon, London; H. J. Dawes, West Bromwich; H. Hunter, Newcastle-on-Tyne; M. J. Carroll, Kilmallock, Ireland; A. Tindall, London; C. Pack, Lymington; Dr. A. J. Haslam, Dublin; H. C. Cunningham, Slateford; Henry Gray, London; "Progressionist."

BOOKS AND PAMPHLETS: *Dr. W. Reuss*, Zur Kenntniss der Lysole des Handels; *M. Dele*, Importation et Exportation des Viandes par Voie de Mer; *Veterinary-Lieutenant-Colonel W. B. Walters*, Stable Management; Procès-Verbal de l'Academie Royal de Médecine de Belgique; Further Papers and Correspondence Relating to the Landing in Great Britain from Canada of Cattle affected with Pleuro-Pneumonia; Proceedings of the Twelfth General Meeting of the National Veterinary Association; *E. Aureggio*, Les Chevaux du Nord de l'Afrique.

JOURNALS, ETC.: *Baily's Magazine; Archiv. fur Wissenschaftliche und Praktische Thierheilkunde; Mark Lane Express; Lancet; Recueil de Médécine Vétérinaire; British Medical Journal; Clinica Veterinaria; Echo Veterinaire; Medical Review; Agricultural Journal of the Cape of Good Hope; Medical Press and Circular; Annales de Médecine Vétérinaire; Presse Vétérinaire; American Veterinary Magazine; Journal of the Royal United Service Institution; Revue Vétérinaire; Live Stock Journal; Edinburgh Medical Journal; Thierarzt; Veterinarian; Journal de Médecine Vétérinaire et de Zootechnie.*

NEWSPAPERS: *Madagascar News; Edinburgh Evening Dispatch; London Morning Advertiser; Scotsman.*